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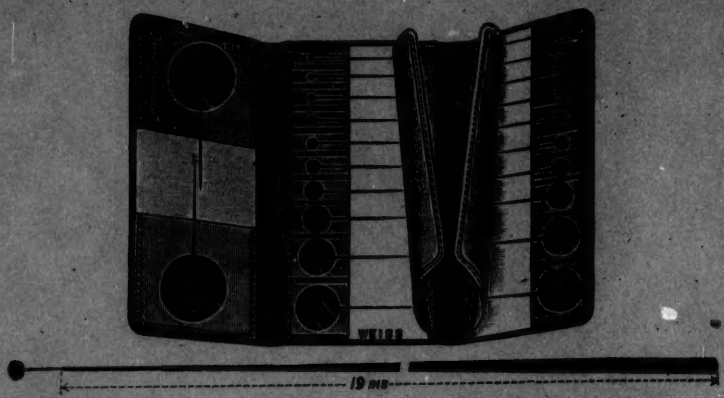

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THE BRITISH JOURNAL
OF
OPHTHALMOLOGY
AUGUST, 1917

COMMUNICATIONS

REPORT ON OPHTHALMIC CASES IN CAIRO AND ALEXANDRIA

BY
H. L. EASON, C.M.G.
LIEUT-COL., R.A.M.C.

I HAVE the honour to submit herewith a statistical report of the ophthalmic cases seen in British hospitals in Cairo and Alexandria from January 1st to June 30th, 1916, together with some general remarks upon the ophthalmic practice as a whole. As I have seen cases only in the capacity of a consultant, I have not entered into details of particular diseases or cases; but since my experience has been over a wider area than that of any single ophthalmic surgeon in Egypt, my general impressions may be of some slight interest.

I have confined myself to a brief survey of the common or more interesting affections. These statistics do not include cases seen in districts other than Cairo or Alexandria (with the exception of some cases examined by myself on various occasions in outlying camps), as owing to changes in personnel or in actual hospital units, continuous records have been difficult to obtain. Nor, in addition, can they be considered as entirely exhaustive for the conditions named, as a certain number of cases have not been reported and the records of others have gone astray; still, such as they are, they afford a fairly accurate picture of the ophthalmic work in Egypt during the last six months.

Statistical Analysis of Ophthalmic Cases seen in Cairo and Alexandria, January-June, 1916

CASES.	No. 15. General Hospital, Alexandria.	No. 17. General Hospital, Alexandria.	No. 19. General Hospital, Alexandria.	No. 21. General Hospital, Alexandria.	Citadel and Nasrieh Hospitals, Cairo.	No. 27. General Hospital, Abbassieh.	Wady Matrun Fayoum, etc.	Total.
Errors of refraction:								
Myopia	100	128	15	18	116	33	44	454
Myopic astigmatism... ...	142	120	29	42	70	27	24	454
Hypermetropia	86	195	26	54	66	36	29	492
Hypermetropic astigmatism	106	168	35	89	57	29	22	506
Mixed astigmatism	47	72	7	19	14	42	6	207
Presbyopia	98	27	17	13	41	27	1	224
Squint...	27	81	9	1	21	4	22	165
Amblyopia in one eye ...	—	89	3	2	54	—	33	181
Injuries of the eye:								
G.S.W., enucleation ...	—	—	—	10	1	—	—	11
,, previously enucleated	7	3	—	1	4	8	—	23
,, totally blind	1	—	—	—	—	—	—	1
Traumatic conjunctivitis ...	1	—	1	1	—	—	—	3
Perforating wound of globe	—	1	2	2	1	—	—	6
Foreign body on cornea ...	14	13	2	11	2	6	—	48
Traumatic coloboma of iris...	1	—	—	—	—	—	—	1
Irido-dialysis	—	1	—	—	—	—	—	1
Foreign body in lens ...	—	1	—	—	—	—	—	1
Traumatic cataract	10	3	2	2	—	—	1	18
Retinal and vitreous hæmorrhage	3	1	—	1	—	—	—	5
Ruptured choroid	—	5	1	—	—	—	1	7
Dislocated lens	—	4	1	1	3	—	3	12
Wound of orbit	—	—	2	—	—	—	—	2
Diseases of the Eye:								
Conjunctivitis	73	132	22	22	227	54	25	555
,, (angular) ...	17	84	18	—	4	—	8	131
Corneal nebula	44	64	3	4	26	10	6	157
Corneal ulcer	17	60	4	8	30	11	—	130
Choroido-retinitis	13	13	—	1	6	8	1	42
Macular choroiditis	—	15	—	—	2	—	—	17
Trachoma	8	7	2	3	8	—	—	28
"Shell shock"	2	1	2	—	—	—	—	5
Night-blindness	3	7	—	1	11	—	—	22
Nystagmus	7	19	—	1	7	1	7	42
Other affections	228	319	49	43	171	44	122	976
No appreciable disease ...	167	371	75	41	157	40	32	883
Total	1,222	2,004	327	391	1,099	380	387	5,810

1. Ophthalmic surgery in Egypt from October until June, 1916, has been of a very limited character, confined almost entirely to the excision of a few blind or hopelessly damaged eyes. This limitation has been due to the fact that in Egypt itself there has been comparatively little fighting, and that the centres of military

activity, the Gallipoli Peninsula, Salonica, and Mesopotamia, have been so far distant that cases have seldom arrived in Egypt sooner than a week after the wound has been received. In view of this fact, and of the urgency of treatment in cases of ocular injury (for it is practically useless to attempt to save an injured eye later than 48 hours after the original wound), it was early arranged that, for the Gallipoli Peninsula, as far as naval and military exigencies permitted, all cases of injury to the eye in which any sight remained should be put ashore at Mudros, only a few hours away, where they could be under the care of Major F. Lockhart Gibson, of the 3rd Australian General Hospital. Major Lockhart Gibson's Report of the work done by him at Lemnos is published as a separate communication in these columns.

2. As a result of the considerations mentioned above, the work in the Egyptian Hospitals has been practically limited to the ordinary routine arising from the presence of a large garrison. As will be seen from the statistical table, nearly 50 per cent. of the cases, and a great deal more than half the work, has been due to errors of refraction, and it is everywhere apparent that, as in civil life, the basis of the military ophthalmic surgeon's work is in the estimation and correction of these errors. It is also particularly with reference to refraction work that the medical officer previously accustomed to civilian practice finds it difficult only at first to look at the situation from the military point of view.

3. When a patient presents himself for examination in private practice, it is usually because he has some visual defect which he wishes corrected, or because he suffers from some secondary affection, such as headache, which he wishes relieved. Under the circumstances he tries to see as well as possible with his glasses; he is anxious to be improved; and his frame of mind is one of active assistance to the surgeon. The converse is frequently the case with the soldier. More often than not, the visual defect from which he is suffering is used by him as a possible means of avoiding active service, or if not actually of avoiding all service, of getting some lighter duty at the base or on the lines of communication. He therefore makes the most of his defect instead of the least, and is not actively concerned with getting it improved with glasses.

It is a source of great concern to some ophthalmic medical officers, on first taking up military work, to find such a surprisingly low average of visual acuity amongst the soldiers, especially when it is associated with a striking absence of high errors of refraction or of organic disease. Experience soon shows that this low visual acuity is not to be taken too seriously, and that if one finds no great error of refraction, or organic disease, the strong presumption is that the man's vision is normal or thereabouts, whatever the man may say to the contrary.

4. In this connection it may be remarked that the most difficult aspect of military ophthalmic practice is that in the great majority of cases one is dealing with symptoms and statements only; defective vision, headache, night-blindness, intolerance of light, shell-blindness, all the common military ocular complaints, are diseases of symptoms with practically no physical signs.

In cases of defective vision, not total blindness, there is no means of telling how much a man sees, except from his own statements, and if he does not mean to see test-types on a wall, nothing will make him do so, and a proof that he does see with any definite degree of visual acuity is almost impossible. On general considerations, and by various dodges, one can form a very fair opinion of a man's bona fides, but there is seldom any proof which can be demonstrated in a court of law. The question is always one between what the ophthalmic surgeon thinks the soldier should see and what the soldier will confess to seeing, and between these two conflicting opinions there may be no demonstrable decision. Fortunately, in the estimation of errors of refraction, retinoscopy affords a rapid and purely objective means of estimating the approximate extent of the soldier's visual defect, and if his statements as to his vision do not bear some relation to the nature and amount of his error he may in most cases be classified as a malingerer.

5. The same considerations apply to nearly all the other conditions mentioned above. There is in every case the assertion of the patient as to what he can or cannot see, and a total absence of physical signs. Any decision as to the facts of the case merely depends upon the credibility of the witness and the credulity of the observer.

For my own part, my experience during the last nine months (certainly an experience limited to a special class of cases) has been to convince me of the profound truth of the old legal aphorism that "what the soldier said is not evidence." The ophthalmic surgeon who believes all that he is told by soldiers and writes papers on war diseases which consist solely of symptoms, is merely writing fairy tales second-hand.

6. The experience gained generally in Egypt has been exactly that obtained by the ophthalmic surgeons in France, as noted in a recent memorandum by the Director-General.

Unless a soldier gets an obvious improvement in vision by the use of spectacles, he will probably not trouble to wear them. Myopes of moderate degree are most benefited by spectacles, and are the most grateful for them. Hypermetropia and astigmatism, up to about two dioptres, make very little difference to the visual acuity, and even with high degrees of mixed astigmatism, vision may be as good as 6/12, as anyone may ascertain from actual experiment with the appropriate lenses.

Men with low degrees of myopia and myopic astigmatism see very well in the brilliant light of Egypt, and do not complain of glare, but soldiers with hypermetropia and hypermetropic astigmatism do suffer to a considerable extent from the sun and by reflection from the sand.

7. The general practice in Egypt has been to refuse glasses at the public expense to those soldiers whose visual acuity reaches the old Army standards. Exception has, of course, been made in the case of N.C.O.'s and men principally or entirely employed in clerical work.

If a man is told that he will have to buy his own spectacles and that even though his sight is slightly defective, he will be considered fit for duty, with or without spectacles, in the great majority of cases he says he will not trouble about them any more; if he does elect to buy glasses himself for a slight error, he is probably really suffering, will wear the glasses when he has them, and will benefit from their use.

To attempt to correct all astigmatism in the British Army by ordering spectacles for every error, however small, though praiseworthy from the point of view of the ophthalmic purist, would be an impossible task, and have no military justification.

8. Nevertheless, although it has been said, and quite rightly, that a high degree of visual acuity is not needed as a rule, since this is chiefly a war of bombs and grenades, and that rifle shooting at long ranges is now required only of picked men, still the fact must not be overlooked that soldiers with visual defects, both hypermetropic and myopic, do complain, and with justification, that they cannot see to do sentry duty at night, as they suffer from partial night-blindness. For although a soldier may see 6/24 with each eye by day, his visual acuity may be much lower at night, the myope because his dilated pupils admit of much more diffusion of images, and the hypermetrope because in dim light he cannot fix individual objects upon which to accommodate, so that an error latent in the day, becomes manifest at night.

Although it is easy, therefore, to say that a soldier with vision up to the old Army standard is fit for any service in the day-time, it is often difficult to state definitely if in a border-line case he is or is not fit for sentry duty at night without glasses. And, on the other hand, a sentry wearing glasses is practically useless on a wet and windy night.

The question of night-vision is therefore of considerable importance and will probably require further investigation in the future if the wearing of spectacles in the Army becomes more common than it has been in the past.

It is unfortunate that the term "shell blindness" should have been framed for this familiar condition, which was known to

all those who, before the war, were concerned with cases of compensation under the Workmen's Compensation Act. The tightly closed eyes, the intolerance of light, and the complaints of slight or serious defects of vision, associated with the absence of all physical signs or localizing symptoms are the same during the war as they were before it, and, as in civil life the condition rapidly cleared up after the settlement of the case in the courts, so, I have little doubt, the conclusion of peace will be rapidly followed by the recovery of all cases of shell blindness, however severe they may be.

In the later months of last year, when active fighting was proceeding on the Gallipoli Peninsula, a fair number of cases of functional loss of vision ascribed to shell shock arrived in Egypt; but since the beginning of the year, few have been seen. In all cases the recovery was rapid, and I do not remember that any patients passed through my hands for invaliding home. Major Edgar Brown, of the First Australian General Hospital, reporting on the ophthalmic work at Heliopolis, remarks that "the prognosis is good in all cases," and with that opinion I am in complete accord.

The treatment suitable is an entire absence of ostentatious sympathy and fussing; an assurance that recovery is certain and will be rapid; regular employment at some work, however simple; and some degree of isolation. Colonel W. T. Lister, A.M.S., consulting ophthalmic surgeon to the forces in France, tells me that he has found that isolation in bed, bandaging both eyes, fluid diet, and deprivation of tobacco, cures most cases in about forty-eight hours.

Much has been written about the value of suggestion in the treatment of these cases, and there is no doubt that simple suggestion, hypnotism, and such faith cures as the prescription of spectacles for the correction of low degrees of astigmatism, are all efficacious, but the value of any single one of these methods of cure should not be rated too highly, as there is little doubt that cases get well without such treatment. I have found also that suggestion of other kinds is equally useful. A remark dropped in the patient's hearing that he will be invalided home in a few days, has sometimes resulted in his being found reading the newspaper in a quiet corner the next day; others have rapidly improved as the result of a threat of light but disagreeable employment. Few functionally blind soldiers can resist following the movements of a coin dropped, apparently accidentally, upon the floor or stairs; and a sudden crisis, as in the case that occurred on the sinking of the Lusitania, will often be followed by the sudden restoration of sight, just as cases of functional aphonia have recovered in the excitement of a boxing match, a fire, or under the influence of alcohol.

In one or two cases of defective vision following concussion, localizing symptoms in the shape of partial or complete hemianopia

have been found, and in these cases there was little doubt that the visual defect was due to bruising of the occipital cortex caused by the back of the head being hit during the act of falling.

In no case of typical shell blindness have I personally seen any physical signs whatever, although in cases of actual concussion of the eyeball by the passage of a bullet in its immediate neighbourhood, numerous retinal hæmorrhages and disturbance of retinal pigment are a common feature. Retinal hæmorrhages have, however, been seen by other observers in cases of shell concussion without external wound.

10. Many soldiers in Egypt, both British and Indian, have complained of night-blindness. As this condition may be associated with malnutrition, careful examination has always been made, but little actual disease has been found. A few cases of genuine retinitis pigmentosa have been seen, but no cases of conjunctival xerosis; and in the majority no ocular disease has been found, and the men have appeared to be in good condition and well-fed.

In two very interesting cases, both in officers, the night-blindness was only transitory, the failure of vision coming on at twilight and lasting for about two hours. At the end of that time the retina had adapted itself to the diminished illumination and vision was as good under the circumstances as that of normal persons. In both instances the condition was congenital, the fundus showed a wide-spread pigmentary change, not the typical spider cells of retinitis pigmentosa, but more lumpy and aggregated, with numerous small peripheral white patches, resembling retinitis punctata albescens.

This delayed adaptation of the retina to the dark has also been observed in some cases of high myopia, in which there was a thin choroid and a deficiency of retinal and choroidal pigment, and no doubt the intensity of the sunlight and of the glare from the sand in desert stations was the cause of this unusual and exaggerated retinal fatigue.

In the majority of cases, careful observation led to the conclusion that the night-blindness was either grossly exaggerated or imagined. The men alleged to be so affected, managed never to injure themselves in the dark, and on being told that they would not be invalided for the condition, nothing more was heard of it.

In this connection I may remark that I attach no importance to the constricted field of vision so often observed, not only in association with night-blindness, but also with shell shock.

To chart a field of vision accurately, even in a definite lesion of the field, requires considerable intelligence and attention on the part of the patient, and at the best of times the chart is merely approximate, while in functional cases, such as shell shock, a chart of the field of vision is of no value whatever.

I have often demonstrated that a patient, whose field of vision, as

charted, was much constricted, could thread his way among chairs and avoid obstacles in a darkened room in a way that would be impossible for a man with a field of vision so constricted from an organic lesion. I have therefore relied much more on the patient's general power of moving about without accident than on a perimeter chart.

11. Conjunctivitis has regularly caused about 10 per cent. of the ophthalmic cases in the British Hospitals. The two main varieties of conjunctivitis were the Weeks' infection, the ordinary acute muco-purulent conjunctivitis, and the Morax type, the angular conjunctivitis.

Cultivations taken in batches of cases from time to time showed the presence of one or other of these organisms, but the clinical aspect of the cases presented nothing unusual, except for the occasional severity of a Weeks' infection.

The routine treatment for cases of conjunctivitis in Egypt, both in military and civil practice, is by silver nitrate, protargol, or argyrol in acute cases where the discharge is profuse, and by zinc sulphate in all chronic cases, or in Morax infections. The zinc sulphate was usually ordered in solutions of a strength of three grains to the ounce, but I have been informed by Egyptian ophthalmic surgeons of experience that they find 1 per cent. or even 2 per cent. solutions are extremely efficacious and little more painful than weaker solutions.

12. The cases of recent trachoma have been rare and only sporadic, and there has been nowhere anything approaching even a local epidemic.

Considering the universality of the trachoma infection among the natives of Egypt (according to the report of the Director of Ophthalmic Hospitals in Egypt for 1914, over 90 per cent. of the children inspected in the primary schools being affected), this freedom from the disease speaks volumes for the personal cleanliness of the troops and for the efficiency of the sanitary arrangements. The contrast between the immunity of the troops in Egypt during this campaign and the ravages caused by trachoma among the troops during the Napoleonic campaigns in Egypt of a century ago is a striking commentary on the progress of military hygiene.

13. Corneal ulcers have been comparatively frequent, especially among troops camped in the desert. The marginal and dendritic varieties have been the commonest, and the dendritic ulcers especially have proved very intractable. All the ordinary remedies, such as antiseptic ointments, pure carbolic acid, tincture of iodine, or absolute alcohol, have been tried, but in the majority of cases progress has been extremely slow. The corneal epithelium grows over a shallow superficial mass of partially necrotic tissues, forming a very weak scar, and relapse has been constant immediately after

the patient has returned to his duties. Ionisation with zinc sulphate has been tried with success in some cases, but more generally it has been found that the cornea will not heal satisfactorily in the sandy atmosphere of Egypt, and men have been invalided home in the hope that the sea voyage and treatment in England might result in a permanent cure.

14. It has been the impression in Egypt that an unusual number of young men have been seen with early degeneration of the retina and choroid in the region of the macula.

The condition is entirely different from the single focal patch of acute exudative choroiditis in or near the macular region commonly met with in patients in early life, and more nearly resembles the ordinary senile change.

Some of the patients have given histories of having been under shell fire, and it has been a question as to whether these changes may not be a later sequel of ocular retinal concussion.

On the other hand, until access can be obtained to normal civil statistics, it is impossible to state if the condition is really unusually frequent, or whether it has merely been discovered earlier, owing to the greater necessity for acute vision on active military service.

Conclusion

The preceding notes may give the impression that there is little serious disease among the troops and a good deal of malingering and exaggerated functional disease. I think this impression is a true one, and the chief difficulty has been to determine when cases were those of genuine loss of function due to shock, or of malingering. There is no borderline between the two, but a hopeless welter of purely subjective symptoms, exaggeration, and untruth among a class of men very often incapable of accurate statement. I have taken the view that nearly all these ocular affections are only local manifestations of a general neurasthenia or nervous exhaustion, and have referred practically all of them to Major Walsh, the specialist in diseases of the nervous system, for general examination and treatment.

Fortunately, as I have said before, the prognosis is generally good, and a little sound advice and sane untheatrical treatment effect a rapid cure in nearly every case.

Finally, in justice to the troops generally, it must not be forgotten that our experience has been limited to the examination of those men with a low nervous system or morale, and that they form a very small percentage of the whole force. My remarks must, therefore, not be taken as implying any general reflection upon the courage and endurance of the Army as a whole.

REPORT ON THE OPHTHALMIC DEPARTMENT, LEMNOS

BY

F. LOCKHART GIBSON,

MAJOR, A.I.F.

OPHTHALMOLOGIST, 3RD AUSTRALIAN GENERAL HOSPITAL.

FOR a short period the eye cases were distributed throughout the Hospital, and were treated by me in the wards in which they happened to be. Next, a single marquee tent was allotted to me. After the first week in September, the department became established in three marquees. Two of these were always available for in-patients, and the third was used as a consulting and ophthalmoscopic room, a portion being divided off as a waiting room for out-patients. Later on another marquee was added and filled for a time with patients.

During the last part of our sojourn at Lemnos, a hut (24 feet by 10 feet) was erected for my consulting room. Haab's giant magnet was, after that, utilized there instead of in the operating room.

My services, by direction, were made available to all the other hospitals and units on the island, as well as to those on the ships in the bay. Many Greek villagers also consulted me. The out-patient *clinique*, which averaged some twenty patients daily, supplied some of the in-patients for the wards.

Owing to Major Kent Hughes's absence and illness, I had also to undertake the ear, nose, and throat work; but by the end of September, it was found impossible to cope with the out-patients, and Captain Anderson saw them for me. I continued merely as consultant, and saw any unusual or acute cases with him, and other officers. There were always some ear and throat cases in the eye wards, chiefly tonsillitis and acute or sub-acute otorrhœa. An isolation tent was subsequently added, so that doubtful throat cases were not admitted into the wards.

The records of 126 eye cases have been preserved; I am of opinion that a good many have gone astray.*

These are first separated into two large groups, viz.: (1) cases neither directly nor indirectly attributable to explosive weapons, and (2) those attributable either directly or indirectly to explosive weapons—included in these are shrapnel, bombs, and bullets and in the indirect injuries, excoriations of the conjunctiva and cornea from

*Compared with the work of the department at Abbassia, the numbers of in-patients are small. More ophthalmic cases were admitted in a month at Abbassia than in four months at Lemnos, but a majority of the cases admitted at Abbassia would have been treated as out-patients at Lemnos. All admitted at Lemnos required hospital treatment. At Abbassia, conjunctivitis, cases requiring correcting glasses, and cases admitted only for "boarding" had to be kept in hospital.

parapet sand and gravel and the impaction of fragments of sand and gravel in the cornea. In each group rather more than 60 cases will be found, practically dividing them equally.

To classify them into anatomical groups, an additional group for foreign bodies in the eye and another for enucleations must be added. It is found that no case of much importance falls outside one or other of these groups. As many eyes received more than one injury such grouping brings the number of cases up to 200 or more.

(1) Conjunctiva, 44; (2) cornea, 51; (3) iris, 11; (4) lens, 13; (5) vitreous and fundus, 13; (6) sclerotic, 7; (7) lids, 8; (8) orbit, 5; (9) anterior chamber, 4; (10) foreign bodies, 30; (11) enucleations, 14.

Foreign Bodies.—To refer briefly to the most interesting points in these groups of cases, but departing from the order above given: there were 14 intra-ocular foreign bodies, if we include 2 which were within the sclerotic coat, but perhaps not within the choroid. Of these, 6 were removed: 3 from the anterior chamber; 1 through the wound in the sclerotic from the vitreous chamber close to it. In this case, a piece of steel, was not from an explosive weapon; 2 from within the sclerotic, but probably not within the choroid. 6 foreign bodies were left *in situ*.

Of the 6 cases from which intra-ocular foreign bodies were removed, 4 see as well as before; one sees 6/18 only, because small erosions on the cornea have interfered with its transparency; one has an absorbing traumatic cataract, and may require discission.

Of the 6 eyes retaining their foreign bodies, 2 have useful sight, viz., 6/12 and 6/18; one may regain sight after the lens has been absorbed, subsequent to further discission; one has no sight; one has no sight, and the eye will probably have to come out; one patient, a Greek, refused to have the eye removed, although warned of the possible danger to the other eye. It contained two foreign bodies, had a partial traumatic cataract, counted fingers, but showed ciliary irritation at times. The giant magnet failed to attract the foreign bodies.

The remainder of the thirty eyes amongst in-patients which contained foreign bodies, included foreign bodies in the cornea and under the scleral conjunctiva. Several of the eyes had more than one foreign body. Many foreign bodies were removed from out-patients who continued to be treated, if necessary, as out-patients. A peculiarity of the foreign bodies in the cornea was their depth. Many had practically reached Descemet's membrane, and it was with the greatest difficulty that they were removed. A spud in many cases was not sufficient, the point of a Graefe's knife being necessary. Another peculiarity was the minute size of many of the intruding substances. Their size and depth demonstrated the great force with

which they had been projected. (In civil practice, small fragments do not come with sufficient force to be embedded deeply in the cornea.) They were composed of steel, lead, nickel, and sand or gravel. The eyes in all cases did well, but the foreign bodies left permanent minute opaque scars.

Two fair-sized foreign bodies were found in the orbit, one, a piece of steel, had entered at the inner end of the eyebrow and was detected by the X-rays under the roof of the orbit, fairly far back. The giant magnet pulled it forward under the conjunctiva of the upper fornix, and then, on everting the lid, pulled it, without an incision being necessary, across an inch of space. The other foreign body had grooved the edge and conjunctival surface of the lower lid. The scar had healed, but there was discomfort in turning the eye up. An X-ray examination detected the foreign body above the floor of the orbit fairly far back. The giant magnet failed to cause any feeling of discomfort or to attract the foreign body. The discomfort gradually subsided, and the man rejoined his unit, retaining the foreign body, with unaffected sight.

The fourteen enucleations were of eyes injured by projectiles. They all did well, although several had other injuries in addition to the eye injury.

In no case had I to remove both eyes, but in one case the remaining eye was badly injured, and its retina became detached. It is blind, but may be kept, and is not disfigured.

In another, the second eye, like the one removed, also contained pieces of wood, and it will almost certainly require to be enucleated, although the pieces of wood were removed.

Conjunctiva.—All the pterygia (8) were large ones, and all in members of the A.I.F., except in one case. These growths were removed. The lower half was cut away entirely, and the upper half detached, turned downwards and fixed in the wound so left, a method introduced, I believe, by Thos. Evans, of Sydney, and used by me for many years when the pterygium was a large one. It ensures against return, and should be the operation of choice.

Only one case had to have both eyes operated on.

A severe case of symblepharon had been operated on in England, with bad result, by transplantation of skin. A graft of buccal mucous membrane transplanted, after removing the scar and the bunched-up skin, held, and a good result was obtained.

Cornea.—The cases of corneal ulceration were due to injury, to phlyctenular inflammation, and to the results of acute conjunctivitis of a catarrhal nature. There were no cases of gonorrhœal ophthalmia.

Three cases due to injury proved to be severe infective spreading ulcers, accompanied by hypopyon and chemosis. One I failed to arrest, even with the electro-cautery. The eye had to be removed. One, in a Greek, where the ulcer occupied fully 2/3 of the

cornea, with hypopyon, and chemosis, was arrested by the electro-cautery. Subsequent optical iridectomy gave the eye useful sight. The third case, in which the ulcer was smaller, but the chemosis extreme and the hypopyon very marked, responded quickly to the electro-cautery and regained excellent sight.

Lens.—Injuries to the lens were accompanied by other injuries to the eyes. Amongst out-patients there were some peculiar lens opacities which may not have been congenital, but due to shell concussion. There were also a good many cases of ordinary congenital lamellar cataract amongst the English troops.

Iris.—Under the head of iris, were several cases with other injuries also. The five most interesting, were two operative and three iritis cases. Of the two operative cases, one was the Greek's eye above-mentioned, the other an eye in a young officer suffering from intermittent attacks of glaucoma. It was due to a penetrating injury to the upper corneo-scleral margin "during child-birth." The pupil was occluded and drawn up. A very fine pin-point slit at the edge of the occluded pupil allowed imperfect intra-ocular circulation, but at times this became blocked, resulting in an attack of glaucoma, with high tension, a shallow anterior chamber and bulging iris. These attacks had been very frequent latterly, and were becoming severe. When comfortable, the eye had *minus* tension. During an attack, the tension was + 1. An iridectomy not only relieved him from attacks and produced normal tension, but also gave some sight to an eye which had never had more than bare perception of light. He counted fingers at several yards and may improve further. He was able to rejoin his regiment without fear of further attacks.

Of the three iritis cases, two proved to be rheumatic and one syphilitic. They were all severe, had occluded pupils and chemosis, and failed to count fingers. Massive doses of salicylate of soda (300 grains within 30 hours) together with 600 grains of citrate of soda, were followed by breaking-down of the adhesions, and continuance of treatment and of atropin led to quite satisfactory results and good sight. The syphilitic case responded perfectly to energetic mercurial inunction.

Fundus.—There were many interesting fundus cases and still more of them amongst the out-patients.

One lad who had been invalided back from Gallipoli had a central scotoma, due to a subhyaloid hæmorrhage at the macula. He was admitted, and after a few days, mild attacks of tertian malaria developed. This was confirmed by Major C. J. Martin's examination of the blood. He responded at once to quinine. The subhyaloid hæmorrhage may have been nothing more than a coincidence. The prognosis, judging from other cases of subhyaloid hæmorrhage, in my experience, is hopeful regarding sight. Another case of hæmorrhage

in the fundus occurred in the Commanding Officer of another unit. He had several hæmorrhages into each retina and into one disc. No cause could be discovered. His urine was normal in every respect. It was surmised that the antiscorbutic or antiberiberi constituents of his diet may have been insufficient. He was treated accordingly and, of course, invalided home.

Remarks.—The conjunctival cases were catarrhal, phlyctenular, and traumatic inflammations, and pterygia. Only one specimen of catarrhal secretion was sent to the pathologist, and the report was negative. The cases were often severe and were frequent amongst the Greek population of the island, both in adults and children. Corneal ulceration was present in some of the Greeks and also in some of the troops when they came under observation. A lotion containing sulphate of zinc, gr. iii, and boric acid, gr. xii, to the ounce of water, acted practically as a specific. It caused improvement at once, and when the cases were not of long-standing, rapid cure resulted. Many catarrhal cases suffered also from phlyctenular conjunctivitis, and required, in addition, yellow oxide of mercury.

I met with no case of trachoma in Lemnos. The few seen had come from Egypt, or were recrudescences in Australians who had previously suffered.

Although I can only say that two foreign bodies were removed by the giant magnet, one from the interior of the eye and one from the orbit, which would have been difficult or impossible to remove without so strong a magnet as Haab's, the knowledge and help given by it in other cases were so great that I should have felt imperfectly equipped without it. Until it arrived, I had only a Hirschberg's hand electric magnet (8-volt dry cells), but it enabled me to remove one piece of steel from the anterior chamber. At least two cases might have been benefited had the giant magnet arrived sooner. The fact that the X-rays also were not available during the first few weeks was a considerable handicap.

The failure of hospital boats to get transports, diminished the number of cases of injured eyes which should, according to orders, have come to me from Gallipoli.

Two things militated against the greater usefulness of the giant magnet, viz.: the time which always elapsed before the cases arrived at Lemnos, and the minute size of the foreign bodies. In the case of small bodies the force with which the magnet attracted them was slight, and consequently any plastic lymph anchoring them in the eye was able to hold them. This was clearly demonstrated in the case of a minute piece of steel lying between the lens and iris, and attached to each by lymph. The magnet failed to bring it into the pupil area. The lymph stretched, but did not relinquish its hold on the foreign body. It was eventually picked out of the anterior chamber by forceps after a small iridectomy.

The only two eyes removed after failure to extract the contained foreign body by the giant magnet contained respectively a piece of lead and a piece of copper.

The out-patients who were supplied by other units and hospitals on the island, and by the ships in the bay, averaged about twenty a day, from 10 September to the first week in January. Notes of 1,004 new ophthalmic out-patients were taken during that time. A large number of these were cases of refraction, many of whom I found to be so benefited by glasses as to be made efficient, whereas before they could not have been so. Most of them stated that no attempt had been made in England to test their vision. 254 prescriptions for glasses were given. I found after a time that many of them were not made use of, and then refrained from giving prescriptions, unless the men or their N.C.O's. said those given would be sent to an optician. Latterly, the prescribing of spectacles was put on a very satisfactory basis, partly, I think as a result of my representations to Surgeon-General Babtie. He ultimately prevailed on the War Office to supply the men with glasses, cylindrical or otherwise.

The routine which was proposed by Surgeon-General Babtie, after consultation with Lieut.-Colonel H. L. Eason, who had also discussed the question with me, and which was adopted during my last few weeks in Lemnos, may be expected to meet all objections to ordering and supplying spectacles to the troops. It was as follows.—Prescription to be sent to the base department at Alexandria, to be entered in the last page of the man's pay book, together with a statement of his vision, without and with correction. Two pairs of spectacles to be sent to the man's O.C. Breakages or loss to be supplied by the man himself, and without his return to any base.

Major Herschell Harris gave me most valuable help by taking X-ray pictures of eyes and foreign bodies or possible foreign bodies.

Owing to the generosity of the Queensland Red Cross Society, which cabled me £200 to London for the purpose of equipping my department, I was able to get all the instruments I required, including a Haab's magnet.

Appendix

1. *Intra-ocular foreign body.*—A young officer had suffered from several wounds from a bomb explosion. One piece had entered the sclerotic of the right eye on its inner side, behind the ciliary region, and passed backwards through the vitreous, into the sclerotic coat or through it and just to outside. In spite of the blood in the vitreous chamber, it was possible to see the posterior wound in the coats, situated above and to the inner side of the disc, but no foreign body could be detected. The X-rays located the foreign body either in the eye or just outside the coats in the neighbourhood

of the posterior wound. The giant magnet failed to attract it from the orbit or through the re-opened wound, or to cause any sensation of discomfort. The pieces of metal found elsewhere in his body were steel. He regained 6/12 of vision—of course, with a scotoma in the position of the posterior injury. The conclusion come to was that the foreign body had at least got as far as the sclerotic and possibly just through it, and that there was a fair possibility of the eye not suffering further.

2. *Case of left Homonymous Hemianopsia.*—I was asked by Colonel Sir Alexander McCormack to see this case just prior to trephining. He will report it elsewhere fully himself. The injury, a bullet wound, was in the right occipital lobe in the angle formed by the longitudinal sinus and the lateral sinus. Direct injury was done to the right occipital lobe, apparently chiefly, if not entirely, to its mesial portion. Prior to operation, he had complained of bilateral left hemianopsia and a very small right field. The result supported the conclusion that the left occipital lobe on its mesial aspect had not suffered directly but indirectly from shock and from the pressure of the hæmorrhage on the mesial part of the right occipital lobe. After recovering from the operation, he had word-blindness for a week or two, not letter-blindness, then his visual word memory centre gradually reasserted itself, and he regained the power of reading words. His right field, which was very contracted, gradually improved, and was improving when he left Lemnos. There were no changes in either fundus at any time. The left hemianopsia persisted, as was expected.

3. *Three bullet wounds of the orbit.*—(*a*) Another case of Sir Alexander MacCormack's was subsequently transferred to my care, when the trephine wound was nearly healed. The bullet had entered the frontal bone above the temporal region on the left side and passed out at the angle of the right lower jaw. The case was trephined, but one or two small fragments of the inner table were not removed at the initial operation. The left eye was very proptosed with considerable chemosis and solid œdema of the lids, but neither lids nor conjunctiva showed at first or later any signs of blood extravasation. The external ocular muscles were all paralysed, even the orbicularis; apparently more by the solid œdema than by direct interference with nerve supply. There was no optic neuritis nor alteration in the vessels of the fundus, until nearly two months afterwards, when optic atrophy began to show at the disc. The external ocular muscles all recovered. Cosmetically, the eye will be excellent. It will not worry the other, but it will have no sight. The œdema and paralysis did not finally disappear until a fine spicule of the inner table was removed through the trephine wound some six weeks after the injury.

(*b*) In a case seen with Lieut.-Colonel Cudmore, and afterwards

transferred to my care, the bullet had passed through the back of the orbit, and directly injured the posterior part of the globe. There were chemosis, proptosis, much ecchymosis in lids and conjunctiva, and some intra-ocular hæmorrhage. The proptosis and chemosis subsided. The eye did not inflame. Its tension became *minus*. It had, of course, no sight, but the man was able to go home with the eye in, although cosmetically not perfect, and somewhat shrunken. He was advised to have it removed later.

(*c*) Another bullet took an extraordinary course.—It pierced the right upper lid in its external third, passed out between the edges of the lids without wounding them, but after destroying the cornea, and indirectly the lens, pierced the skin again where the lower lid joined the cheek, passed through the right nostril and the floor of the left nostril, and out through the upper lip below the left nostril. The right eye was removed on admission.

4. *Traumatic myopia.*—A soldier on the island injured his right eye while chopping wood. The lens was dislocated forward, making the anterior chamber shallow, and causing five dioptres of myopia in a previously emmetropic eye. The lens remained clear, and with —5D. the eye saw 6/12. As I have observed twice before, complete accommodation was retained, although the ciliary muscle must have been ruptured.

5. *Post-diphtheritic paralysis.*—Swabs from the nasopharynges of two cases of paralysis of accommodation enabled both to be pronounced by the pathologist to be diphtheria carriers. The previous slight sore throats had not called for treatment in camp.

FUNDUS LESIONS IN CASES OF WAR NEPHRITIS*

BY

J. JAMESON EVANS,

BIRMINGHAM.

THE Medical Research Committee is investigating selected cases of war nephritis, and among other particulars concerning which information is desired, is the state of the fundus oculi. In the course of my examination of these cases at the First and Second Birmingham War Hospitals I found certain fundus changes which suggested to me that if ophthalmoscopic investigations were to be of any help to the Committee, we should have to examine *every* case of war nephritis, and the results obtained by different observers should be then examined in order, if possible, to decide whether this particular form of nephritis causes, or is associated with, changes in

*Communicated to the 1917 Congress of the Ophthalmological Society of the United Kingdom. The full article will be published in the Society's *Transactions*.

the fundus; how far these changes may be regarded as of renal origin; and whether they can be looked upon as of any diagnostic or prognostic significance.

I should like to mention that, so far as my experience goes, the fundus changes which are likely to be met with are very slight in degree and may easily be overlooked unless the examination be made after dilatation of the pupil by direct ophthalmoscopy. Another point I should like to emphasize is that I do not wish to imply that these changes are the result of trench or war nephritis—that can only be decided when we have collected reports from all the investigators—and they must only be accepted as lesions which have been observed in cases which have been diagnosed for me as war nephritis. Further, no attempt has been made to differentiate types or degrees of nephritis, but I think that in future some effort should be made in this direction, but this, again, would have to be done through the Research Committee and the officers in charge of the cases. The following is the result of my examination of the fundus in 100 cases of war nephritis:—

Normal fundus	...	...	43 per cent.
Changes noted in the fundus	...		57 „ „

The fundus changes observed:

1. Involved the optic nerve and retina in 39 cases.
2. Involved the choroid „ 34 „

1. *Lesions of the optic nerve and retina.*—These were in the main very insignificant, and some were so slight in degree that they were doubtfully pathological. In twenty-two cases the optic disc was hyperæmic and slightly œdematous; in thirteen cases there was peripapillary retinal œdema, some perivascular lining, and tortuosity and fulness of the veins. In eight cases the disc appeared pale or greyish without any definite atrophy of the papilla. In only one case was the classical appearance of the hæmorrhagic neuro-retinitis of albuminuria observed, and this was in a man who was fifty-six years of age, and who evidently suffered from chronic Bright's disease. In no other case were retinal hæmorrhages observed. In no other case was any definite evidence of arterio-sclerosis noted, although in two cases there was some suspicion of arterial pressure on the veins. Fine dotted changes in the retina in the macular region were observed in four cases, and one case showed some œdema at the macula with reduction of vision to 6/24.*

2. *Changes in the choroid.*—I was rather surprised to find so many cases showing evidence of choroidal disturbances. Here, again, doubts could be entertained as to their pathological character. Particularly does this apply to eighteen cases which showed

*The discrepancy in the figures is to be explained by over lapping of the conditions.—EDITOR.

depigmentary changes in the equatorial region. These depigmented areas were sometimes arranged diffusedly around the periphery and often showed fine pigmentary deposits; or they were confined to a sector of the globe. At other times they appeared as whitish or yellowish streaks with slightly pigmented borders, reaching from the intermediate zone to the periphery. In none of these cases was there any evidence that there had been acute choroiditis. In twelve cases, however, there were discrete orange coloured spots with little or no pigmentation but evidently of the type of disseminated choroiditis. Two cases showed typical areolar choroiditis with marked pigmentation, such as one might ascribe to syphilis.

Five cases showed guttate changes in the macular region and these we should at once diagnose in patients of more advanced age as central guttate choroiditis, or Tay's choroiditis.

The most peculiar choroidal changes observed were patches of slaty discolouration in the neighbourhood of the macula. These spots—only one of which was larger in size than the optic disc—appeared to be slightly raised and the retina over them gave a sheeny reflex. There were five such cases. In three the spots were situated along the inferior temporal vessels, in one along the superior temporal, and in one on the outer edge of the macula. They seemed to be deeply situated, and only in the last case was vision affected, and it is doubtful if even in this case the depreciation could be ascribed to the slaty spot, as the vision was the same in the unaffected eye (6/12). It may here be remarked that except where the macula was œdematous, there was no reduction of vision, and in no case was I asked to examine a patient because of his sight.

As to the *character of the lesion*, it would appear that both in the retina and the choroid the process is of a low inflammatory nature, giving rise, on the one hand, to slight œdema of the papilla and neighbouring retina, and occasionally a few fine retinal deposits; on the other, setting up depigmentary changes in the hexagonal epithelium and choroid, either with or without slight and fine pigmentary deposits; and occasionally more acute, but more localized foci, showing as fine areolar spots with very limited pigmentary deposits at their edges. The more definitely punched-out yellow or white spots with markedly pigmented rims have been ascribed to syphilis.

The slaty patches are suggestive of small choroidal hæmorrhages; but I can hardly believe they are of that nature, seeing that no hæmorrhages were observed in the retina, and there was no evidence of choroidal congestion. It is possible they were due to small choroidal thromboses.

The nature of the poison.—The changes observed seem to point to a toxic or infective origin. They approach in the main the

fundus lesions we associate with toxicity of advancing age or senility. Diffuse depigmentary changes I have also observed in children, and have ascribed them to the autotoxæmia of gastro-enteritis and such internal disturbances as infants are prone to. The nephritis is of the type which follows scarlet fever, and it is possible that the changes are produced by an infective element. It is also possible that fundus lesions are not uncommon in scarlatinal nephritis, but few of us have had the occasion to examine many cases of the kind. Syphilis has been suggested as the cause, but except in the two exceptional cases referred to above, the appearances of the fundus changes were not, to me, suggestive of syphilis. Sepsis, particularly oral sepsis, has also been suggested as a cause of the nephritis; but there is nothing in the fundus lesions, any more than in the epidemiological aspects of the disease, that gives any support to such a suggestion.

A CASE OF ETHMOIDAL INJURY ASSOCIATED WITH PAPILLŒDEMA, ABDUCENS PALSY, AND OTHER OCULAR LESIONS

BY

CAPTAIN F. W. WATKYN-THOMAS, B.C.Cantab., R.A.M.C. (T.C.)

AND

CAPTAIN R. L. SCOTT, F.R.C.S.Edin., R.A.M.C. (T.C.)

FROM A BASE HOSPITAL IN FRANCE.

PAPILLŒDEMA and other affections of the eye have frequently been observed in cases of accessory sinus suppuration, more especially when the suppuration has been in the sphenoidal or posterior ethmoidal cells. The structural features have been fully described by Onodi, Loeb, and others.

The following case presents some points of interest:—

N——, a powerfully-built countryman, aged twenty-four, is a lance-corporal in a tunnelling company, with thirty months' service. There is no previous history of any ocular trouble except for a "black eye" (right) following a blow from a cricket ball three months previously. He is certain that he had quite recovered from this before he was wounded. On March 28, 1917, he was struck below the right eye by a fragment of shell; earlier in the day he had received a very slight bayonet wound in the right arm. There was no definite history of concussion, and he remembers being carried to the advanced dressing station.

The sight of the right eye has been dim from that time. The wound of the arm was excised, and the face wound, a small

puncture on the lower and outer quadrant of the right orbit, was explored and drained. The orbital margin was found to be chipped, but no foreign body was discovered.

He arrived here late on April 9. On April 10 the wound of the arm was clean and granulating well. The face was asymmetrical, the angle of the mouth being lower on the right. (This is probably his normal state, as no weakness of the facial muscles has ever been detected.) There was a clean, nearly healed incision along the outer half of the right lower orbital margin. The right lower lid was a little swollen, but there was no swelling of the ocular conjunctiva, no proptosis, and no pain; movements of the eye and pupil reflexes were normal. He could count fingers, but complained of dimness of vision. T. 97·6° F.; P. 60. In the morning he was quite well, but that evening complained of a slight headache.

On the morning of April 11 the headache had gone. T. 97°F.; P. 52. In the afternoon he complained of intense and rapidly increasing pain in the right eye; the temperature remained the same, but the pulse rate fell to 48, and he vomited.

All examination was impeded by the fact that he is always rather unresponsive and was then in great pain, pain which was apparently increased to an agonizing degree by any movement of the head. The lids were very swollen and there was chemosis of the ocular conjunctiva. There was no proptosis and no emphysema. There was definite tenderness over the inner canthus. Movements were sluggish in all directions. The pupil reacted to light, but slowly. The intra-ocular pressure was much raised. A very incomplete examination showed that the field was narrowed all around. Only with difficulty could he count fingers at 1m.

Ophthalmoscopic appearances.—Fundus hazy, vitreous hæmorrhages, much exudate, disc red, 3D. of swelling, no retinal hæmorrhages. Vessels, where visible, engorged. Left eye normal.

Nose and nasopharynx.—Clear, no pus seen, nothing abnormal found.

C.N.S.—Cranial motor nerves appeared to be intact, except for the sluggish pupil reflex and the poor movements of the right eye. No anæsthesia over area of the 5th nerve. Abdominal reflexes equal. Natural knee jerks; cremasteric reflexes equal. Plantar response flexor. No ankle clonus, no Kernig's sign, no *tache cérebrale*, no retraction of head or abdomen.

Skiagrams by Captain A. J. H. Iles demonstrated a small fragment of metal well forward, probably in the ethmoid labyrinth. Patient slept soundly after ¼ gr. morphia hypodermically, with aspirin, gr. xv, and phenacetin, gr. v, by mouth.

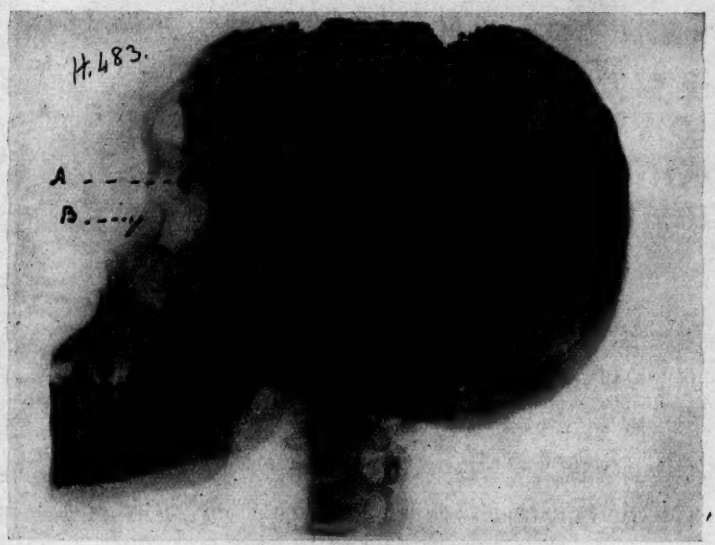
Operation April 12.—The intensity of the symptoms, the small size of the fragment, and the absence of discharge were all against

any intranasal approach, which, also, would not have permitted exploration of the orbit. Guisez's route for the open ethmoid operation, again, would have given poor access to the orbit, and the same is true of the Killian[1] method, although it gives an admirable exposure of the ethmoid gallery. Accordingly we decided on St Clair Thomson's modification of Moure's operation[2], which gives free exposure and trifling deformity. The nose was packed

for 20 minutes with wool soaked in 10 per cent. cocain and 1/1000 adrenalin, equal parts. After ¼ gr. morphia with 1/100 gr. atropin, Captain M. W. Talbot gave chloroform by Junker's inhaler. Nasopharynx was packed with a sponge.

The old orbital incision was prolonged to meet the lateral nasal incision, which was made in the ordinary way, except that the lobule was not detached. The flap was turned back and the infraorbital nerve and lacrymal sac were retracted. The lower chisel cut was made higher into the vestibule than usual, as it was only the orbito-ethmoidal region we wished to explore. When the supero-internal

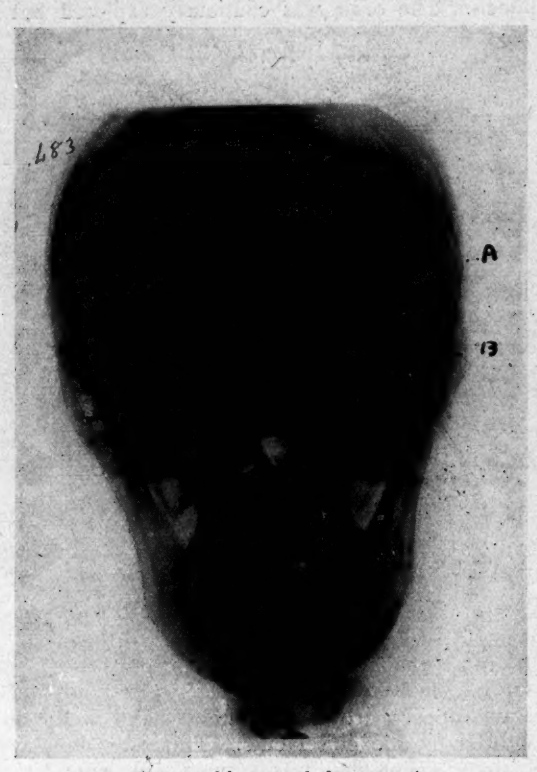
angle of the maxilla had been removed the fragment could not be found (a skiagram taken since has shown that it fell into the antrum probably through the chiselling). The ethmoid gallery was found to be considerably damaged; the bone was splintered as far back as the posterior cells, and the mucosa was engorged and œdematous. The orbito-nasal wall was shattered. No pus was found. All loose bone and damaged mucosa were removed with Hartmann's forceps and Cordes's punch. The orbit was cautiously explored but no pus



A—Position of fragment before operation.
B—Fragment in position on May 5.

was found there, although the orbital connective tissue was very œdematous. For more efficient drainage we thought it advisable to sacrifice the upper part of the lateral nasal wall, which was already fractured by the chisel cuts. This was done with very little hæmorrhage. The flap was sutured with fine gut and the cavity packed with gauze ribbon soaked in 1/10 bismuth in paraffin. When he recovered from the anæsthetic, patient was quite free from pain. He slept well that night; P. 72; T. 100°-4°F. On April 13 the lids and conjunctiva were very swollen but the pupil reacted briskly. The plugs were removed, without any hæmorrhage, on April 14 and 15. Stitches taken out on April 19. The patient could now see quite clearly when the lids were drawn back but complained of "seeing double." On April 20 the swelling of the lids had diminished enough for a complete examination. The swelling

of the disc was now only 1·5 D. as against 3 D. on April 11. There was homonymous diplopia due to paralysis of the external rectus. The exudate had diminished and a vitreous hæmorrhage could be seen. He got up on April 21. On April 26 the diplopia was less marked and the swelling of the disc was only 0·75 D. On May 5 the edges of the disc were much clearer. When marked for England on May 8 the vision was R. 6/24 and L. 6/5.



A—Position of fragment before operation.
B—Fragment in position on May 5.

Skiagrams now showed that the fragment was quite superficial, but we thought that removal should be deferred until healing was more complete. When sent to England on May 12, there was no anæsthesia over the flap or of the upper lid; the lower lid was still œdematous. This seems to occur frequently after resection of the maxilla, and is possibly due to division of lymphatics by the transverse incision. There was very little epiphora or lacrymation.

The vision of the right eye was 6/24 and the weakness of the external rectus was much less.

There are several interesting points in the case:—

(1) The sudden onset of intense pain, which was probably due to the increase of tension.

(2) The association of greatly increased tension with papillitis.

(3) The paralysis of the external rectus.

Several cases of external rectus palsy and papillitis in association with accessory sinus suppuration have been described. Ewing and Sluder[3], in a paper on this complex, attribute the paresis to the relation of the abducens, which lies lowest in the sphenoidal fissure, to the ethmoidal cells.

It is possible that the increased tension was produced by the pressure of the œdematous orbital tissue on the ophthalmic veins.

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PROTECTION OF THE EYE IN WARFARE*

BY

R. R. CRUISE, C.V.O.,

CAPTAIN R.A.M.C. (T.).

WHEREVER the question of body armour arises, the two discordant factors of efficacy and practicability have to be faced.

The steel helmet was the first great and effective compromise between these two factors, and even then it required a rigid discipline to enforce its usage upon a reckless and reluctant soldiery.

The measure of protection against injuries to the head afforded by the steel helmet will, it is hoped, find a parallel in the case of the eye, in the visor which I have designed, and which the War Office has accepted and adopted, and which is now on its trial on an extensive scale.

But before describing the visor, it is necessary to consider the types of injury to which eyes are liable in warfare.

From the point of view of protection, eye injuries may be divided into two classes:—

(*a*) preventible; (*b*) non-preventible.

*Communicated to the 1917 Congress of the Ophthalmological Society of the United Kingdom. The full communication will be published in the Society's *Transactions*.

The simplest instances are, of (*a*) a small shell splinter penetrating the globe; of (*b*) a bullet traversing both orbits.

The latter class needs no further attention. The former class demands most earnest consideration by the ophthalmic world and the military authorities.

To obtain an accurate conception of the extent of this class, one requires statistics covering a large number of cases examined carefully and critically within a brief lapse of time of the injury. Facial wounds heal rapidly, and evidence quickly disappears, so that even under the most favourable circumstances, there must always be a large category of injuries where the verdict between preventible and non-preventible must remain non-proven.

But still there will also be a much larger class where the evidence is clear as to the preventible nature of the damage:

Cases where the cornea is perforated, the iris prolapses, and a septic panophthalmitis results.

Cases where a foreign body has had sufficient energy to penetrate the globe, and remain there.

Contusions of the globe producing a varied and common picture of dislocated lens, and traumatic cataract, iridodialysis, intra-ocular hæmorrhage, and retinal lesions—in this respect I would say, by way of parenthesis, that I have been much surprised by the relatively few cases of detachment of the retina that have occurred in my experience of war injuries.

These and many similar injuries are the result of any form of explosive—shell, grenade, or bomb—sending every kind of matter, mineral, vegetable, and animal, into the eyes in a shower of particles of every size and shape.

The majority of the injuries caused by this type of casualty are due to small particles.

Morax and Moreau, working at the Lariboisière Hospital in Paris, estimated that 54 per cent. of the casualties to eyes, in a series of 486 cases of injuries by shell, grenade or bomb, were caused by *small* particles; and as the result of a critical examination of 698 cases, conclude that 50 per cent., or one-half, of all eye injuries could be prevented by some sort of gauze shield (*Ann. d'Ocul.*, August, 1916).

My own experience, and that of others to whom I have spoken, puts the percentage higher; but even if one estimates that 50 per cent. of all eye casualties are caused by small particles, and that there is a practical form of protection against them, it will be admitted that an imperative duty lies before us to insist on expediting the supply of a practical form of ocular protection to our Army.

My ophthalmic resident, Captain W. L. Holyoak, has assisted me in examining a series of cases at the 3rd London General Hospital,

Wandsworth, and at St. Dunstan's, where, by the courtesy of that indefatigable worker on behalf of the blind—Sir Arthur Pearson—we examined 100 cases, or 200 eyes.

The question to decide was what we should consider preventible. We took a deliberately modest view of the stopping power of the visor of chain mail.

We excluded as non-preventible all injuries by bullets; injuries by shell fragments of sufficient strength to fracture any bones in the orbital, nasal, or malar region; injuries producing deep scarring of the face in the vicinity of the eye; injuries producing extensive scarring of intra-orbital contents, as evidenced by shrinking sockets; severe concussion effects where the globe was outwardly uninjured.

We classified as preventible :—

Cases where the history and appearance made it reasonable to suppose that the injury was caused by a small particle of low energy, causing loss of sight by perforation or laceration of the globe.

Corroborative evidence was afforded by slight superficial skin injuries in the neighbourhood.

We classified as doubtful 16 cases, but we finally decided to include all of these among the non-preventible.

Even so, the percentages worked out :—Preventible, 52 per cent.; non-preventible, 48 per cent. These figures are for 200 consecutive eyes at St. Dunstan's only, and are remarkable when one considers that they are figures taken from an institution to which only the most serious cases are sent, involving loss of sight of both eyes.

When we came to examine the figures from the 3rd London General Hospital, at Wandsworth, the percentage of preventible injuries was still higher.

All the cases were of comparatively recent date, and the evidence to form a decision upon was more definite, and probably the conclusions were more accurate.

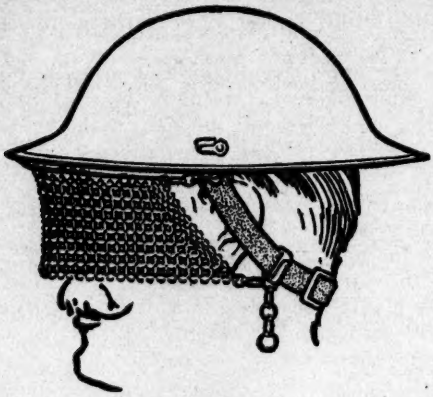
As, however, we have only recently begun to consider percentages, our numbers are insufficient for a final statement; but we propose at a later date to give fuller figures, when further evidence has been collected.

We have examined 120 eyes in the wards at present, and classify them as follows :—Preventible, 65 per cent.; non-preventible, 35 per cent.

Added to the figures obtained at St. Dunstan's, this yields a total of 320 eyes examined, with the result :—Preventible, 58 per cent.; non-preventible, 42 per cent.

So that, if a reduced estimate is made that 50 per cent. of all eye injuries are preventible by a protection such as that afforded by the visor, that would accord with the figures and opinion of Morax and Moreau, quoted before: and, in our opinion, would be an understatement, rather than an exaggeration of the facts.

The visor (see Figure) consists of a transparent mesh of steel rings, so closely linked together that only the most minute particle could pass through its meshes, and then only if it were struck at



right angles to the plane of its surface; a tangential blow would meet with a practically continuous barrier of steel.

The visor is fastened to the helmet. It is therefore not a separate piece of equipment to be remembered, and attached to an already overloaded body.

When not required, the visor can be thrown up on to the brim of the helmet, and lowered again as occasion requires, by the simple process of unhooking a chain, and refastening to another hook.

A chemical process renders the links rust-proof.

PAPILLŒDEMA IN RELATION TO GUNSHOT FRACTURE OF THE MANDIBLE

BY

G. F. C. WALLIS,

MARGATE.

THE papillœdema of the optic nerve seen in the patient whose history is here recorded, presents two rather interesting features: first, in that the cause was apparently a local meningitis from infection through a traumatic fissure of the glenoid fossa; and, secondly, that the optic nerve was not involved until two months after the original wound was received, being excited in all probability by attempts to remove sequestra of the mandible. The patient is also one of the many examples this war has provided of extraordinary tenacity of life after severe injury.

Private A. A. Mc., aged 26, was wounded at Ypres on April 26, 1916. A trench mortar bomb exploded near, from which he received no less than thirty wounds. He was evacuated from Boulogne, and admitted to the Fairfield Red Cross Hospital on May 4, under the care of Dr. Raven. The chief injuries were :— amputation stump through the upper third of the right femur, two fingers of the left hand missing, multiple wounds of the shoulder, chest, and left arm, and the left ramus of the lower jaw shattered. This latter was a deep ragged wound extending from the malar bone downwards and backwards to the sterno-mastoid muscle. The bone was much comminuted, and the lower division of the facial nerve was severed, so that the left side of the face below the orbit was paralysed; because of the state of his jaw, nourishment could be taken only with exceeding difficulty. All the wounds were very septic, the temperature was hectic, and the general condition very grave. By May 12 a hypopyon-ulcer had developed in the right eye, for which the writer was asked to see him. Although the keratitis had only been present for three or four days, owing to the lowered vitality, the whole cornea had become affected. This eye became disorganized, and I removed it two weeks later as soon as he was sufficiently recovered to take a general anæsthetic. On the first occasion that he was seen, the left eye was carefully examined. The conjunctiva below was tattooed with burnt powder, and a piece also was embedded in the outer part of the cornea. Opposite to this the pupil was drawn to one side, but otherwise there was no sign of a perforation. The vision was full, and the fundus and media (with a dilated pupil) were normal. There was no ciliary injection, and the pupil reacted healthily. Towards the end of May, 1916, the wounds had become less septic under treatment by "Eusol" dressings, fomentations, and streptococcal vaccines. The evening temperature was now only 98·4°F.

On June 20, although he had been apparently making steady progress, the fever recurred, and he began to be sick and to suffer from headache. Fragments of sequestra as they presented had been removed from the jaw-wound from time to time during the past few weeks. On June 24, when I re-examined him because he now said that the vision was failing, the pupil was contracted, but reacted normally to light; there was no iritis. Jaeger 6 could only be read with difficulty. A well-developed papillœdema was present, the swelling being + 3D. above the rest of the fundus. The surrounding retina was little involved and there were no hæmorrhages. The sickness and headaches continued occasionally and with decreasing severity to the end of July, whilst the temperature had become normal some time before this date. Throughout August and September the vision and the papillœdema did not improve at all, the disc became increasingly pallid and some exudate

appeared on the vessels at the papilla. During this time the field of vision to rough measurement remained normal. In October the œdema began to subside, and by November 27, at which date he was transferred to the Norbury Jaw Hospital, Croydon, the healthy state was almost restored. The wound of the jaw had contracted down to a small sinus, and with the exception of one finger, all the other injuries had healed.

The long duration of the optic neuritis gave cause for considerable anxiety, lest this poor shattered wreck should lose the sight of his only eye: also, owing to the causation being somewhat obscure, it was a little difficult to know the best line of treatment to adopt.

The diagnosis.—There was no albuminuria, and no possibility of sympathetic ophthalmitis, and obviously the association of neuritis, headache, and sickness pointed to intra-cranial mischief. There was no discharge from the ear, and, in so far as could be judged in such a patient, no giddiness. Consequently, and in spite of his being completely deaf on that side (since the explosion), it did not seem at all probable that it arose from middle or inner ear suppuration. Dr. Raven and I came to the conclusion that the papillœdema had set in about the time that the attempts were made to remove the sequestra. It was therefore possible that the explosive force which had comminuted his jaw had at the same time driven the head of that bone into the glenoid fossa and caused a fracture of the base: that the interior of the skull had, at an early date, been cut off from septic matter by a fibrinous deposit, which, only when the parts were disturbed, allowed the entrance of infection. On this hypothesis a local meningitis had been caused which in turn gave rise to the classical signs of headache, sickness, and papillœdema. Accordingly it was determined to make no further efforts to remove the sequestra, but merely to keep the wound open and drained. An amelioration of the symptoms soon set in, but the papillœdema, as might be expected if due to a meningitis, was a long time in resolving.

On April 17, 1917, an opportunity presented for re-examination of this patient. The wound in the neck was now only a small sinus, and the general condition was good: by means of a specially constructed denture the jaw had been brought to the middle line, and he was now able to eat solid food with some comfort. The visual field was full for a 5 mm. white object, and the acuity of vision 6/5 and J.1. The fundus appeared normal with little or no atrophy of the nerve.

From the satisfactory progress it would appear that our assumption was correct. The importance of dealing very cautiously with a wound of this character requires no emphasis, for it is obvious that much disturbance of the parts might give rise to a fatal meningitis.

NOTE ON RETINO-CHOROIDAL RUPTURES

BY

J. HERBERT PARSONS,

LONDON.

RUPTURES of the choroid are common as result of injuries to the eye; but in the ordinary accidents of civil life the overlying retina is only rarely torn. Ruptures of both choroid and retina are very frequently found in war injuries of the eye. Attention has been specially drawn to this fact by Professor Lagrange in his recently published book on "Fractures of the Orbit."* When the choroid alone is ruptured, a scar composed of a quite limited amount of fibrous tissue is formed. Unless the immediate vicinity of the macula is involved, there is relatively little impairment of vision. When, however, both choroid and retina are ruptured, very considerable masses of fibrous tissue are formed, often projecting into the vitreous, and throwing out processes which resemble those of retinitis proliferans. These masses are very characteristic, and are admirably illustrated in Professor Lagrange's book. It is of interest to search for a possible explanation of their formation.

Some years ago, in a paper on the healing of wounds of the retina, choroid and sclera,† I ventured to suggest an explanation of some of the peculiarities of retinitis proliferans. The following is a quotation from that paper: "Some toxic condition leads to a retinal hæmorrhage. If it is situated in the peripheral parts of the retina, or is due to rupture of the smaller vessels nearer the papilla—in other words, if it is a small hæmorrhage—no large proliferation of new tissue will result. A scar will result from the organization of the clot through the medium of the scanty mesoblastic tissue of the walls of the smaller retinal vessels. If, however, a large hæmorrhage occurs, it will be in the neighbourhood of the disc, or if caused by repeated hæmorrhages in slightly more peripheral parts, will yet invade the neighbourhood of the larger vessels, i.e., again the neighbourhood of the disc. Now, it is around the larger vessels, and *par excellence* upon the disc, that the main mass of retinal mesoblastic tissue is situated. At the papilla itself, we have not only the walls of the vessels, but also remnants of the hyaloid artery and a ring of anastomoses with posterior ciliary vessels—in fact, the largest mass of mesoblastic tissue found in the walls of the true optic cup. The nearer the hæmorrhage approaches this point, and the more widespread its traumatic and irritating effects in this immediate

* Reviewed on page 524 of this Journal.

† Parsons: *Royal Lond. Ophthal. Hosp. Rep.*, Vol. XV, p. 251, 1903.

neighbourhood, the more tissue will be excited to reparative reaction, and the greater will be the proliferation and organization. Hence the fact that retinitis proliferans invariably springs from the disc or its vicinity. In the periphery there are two factors acting against such proliferation: first, the smallness of the hæmorrhage, which, however, may possibly be increased by repetition or multiplicity and confluence; second, and more important, the small amount of tissue which is capable of proliferating and inducing organization."

The proliferation of fibrous tissue in the scars of retino-choroidal ruptures would appear to be susceptible of a similar explanation. In these cases there is a considerable extravasation of blood from the choroid and retina into the vitreous, which is torn up, and, as it were, fractured by the rush of blood. In the ordinary vitreous hæmorrhage, due to rupture of retinal vessels, there is little mesoblastic tissue in contact with the blood capable of providing fibroblasts to bring about organization of the clot. The vitreous itself is inert, and its scanty cells appear to have little organizing capacity. Hence the blood is absorbed and only in exceptional cases does so-called "retinitis proliferans" occur. When both choroid and retina are ruptured the mesoblastic choroid affords an ample supply of active fibroblasts, and the clot organizes into a mass of fibrous tissue in exactly the same manner as in a hæmorrhage into the other connective tissues.

If this suggestion is correct, it provides an argument against the method of removing foreign bodies from the vitreous by introducing the pole of the small magnet through an incision which perforates sclerotic, choroid and retina. By this method the choroidal fibroblasts are enabled to escape into the track of the wound and lead to exuberant fibrous tissue formation. By the alternative method of drawing the foreign body into the anterior chamber with the giant magnet, preparatory to its removal from the eye, the track is not put into relationship with any considerable mass of potential fibroblasts, and consequently little fibrous tissue is likely to be formed. The risks of detachment of the retina, etc., from contraction of bands of scar tissue are thus minimized.

ANNOTATIONS

Specialism and Special Hospitals

IT is scarcely necessary in a journal devoted to a special branch of medicine to enumerate the arguments in favour of specialism in medicine. Yet conservative instincts are strong, and there are still

many members of our profession who view with ill-concealed disapproval the application of the principle of the division of labour to the science and art of medicine. And indeed their attitude is but the expression of an awareness of the disadvantages and dangers of specialism which its exponents are liable to forget; and as such it should be borne patiently and treated with consideration. For each new step in progress entails new relationships which, improperly dealt with, lead to disaster. The man who makes the eye of a needle is a useless member of society unless he acts in fitly ordered collaboration with those who attend to the innumerable other details of the manufacture of needles. Division of labour, whenever and wherever it occurs, inexorably demands appropriately adapted co-ordination. So far as ophthalmology is concerned, its success leads us to conclude that co-ordination is at any rate adequate, even if it be not ideal.

Specialism is the inevitable outcome of the increased knowledge and greater complexity of modern life. It is a normal product of the evolutionary process, and this fact is the crucial argument in its favour. When Saunders founded the first great Eye Hospital in London he did it to fill what is commonly described as a felt need. Others had felt the need as well as he, and Guthrie ran him close in the race to fill it. Probably neither had any idea that he was sowing the seeds of a new specialism, but the seeds were there. They fell into good ground and flourished exceedingly. The new hospitals fulfilled their primary object. The patients were treated, and they were treated better than they would have been under pre-existing circumstances. Not only so, but the surgeons gained more experience of eye diseases and how to treat them, so that they became better craftsmen. Being better craftsmen they devised better tools. In course of time some of the tools became so elaborate and expensive, such as the giant magnet, that to-day they cost large sums of money. Few general hospitals provide these expensive instruments for sporadic cases of intra-ocular foreign bodies, so that the development of special hospitals leads to economy amongst its other benefits. We need not enumerate any others. Special hospitals have fully justified their existence in civil life.

To-day we are in the midst of a great war and all our energies are focussed on that immense theme. As ophthalmic surgeons we are specially interested in the vast multitude of wounded soldiers who have sustained injuries to their eyes. We may well be proud of the great organization which Sir Alfred Keogh has built up, and which, with a success never before obtained in any war, grapples with the innumerable medical and surgical problems of the Army. The success is founded upon experience derived from civilian practice, modified to suit the special requirements. That experience may

perchance yet hold lessons which have not hitherto received full recognition.

The visual requirements of military aviators

The great and growing importance of aviation from the military standpoint and the exacting nature of the work required obviously necessitate a standard of physical fitness different from that required for the ordinary soldier. The visual standard will also have to be superior. C. P. Small, of Chicago, in a recent paper (*Jl. Amer. Med. Assoc.*, March 17, 1917), has raised the question and gives the standard that should be required as follows:—

"1. Uncorrected vision of 20/20 in each eye. 2. Binocular vision. 3. Absence of nystagmus. 4. Normal muscle balance and competent ocular muscles. 5. Normal pupillary reaction and no pupillary irregularities when dilated. 6. Normal media and fundi. 7. Normal visual fields, by perimetric examination. 8. Normal colour sense."

In the body of the paper he asserts that every case must be examined with a mydriatic and comes essentially to the conclusion that nothing less than absolute perfection will do. E. Blaauw, of Buffalo, wrote a letter to the same journal, April 21, 1917, in which he expressed doubts as to the necessity for good colour vision, binocular vision, and mydriatic examination. The correspondence was also carried on in the *Ophthalmic Record*, June, 1917, Blaauw, in that journal, pointing out the necessity of not being dogmatic from an ophthalmic point of view and of being guided by actual experience.

The problem in America is probably not quite the same as with us. The available material is greater, and no one will deny that the nearer perfection one can get the better. So, if Small's contention that nothing less than perfection will serve is correct, our part is rendered very simple, and the matter is at an end. But, before settling this point, it is worth considering what practical aviators have to say on the matter. We have notes of three cases of aviators, two of whom have been decorated for excellent work on the West front, with considerable amounts of mixed astigmatism. None of them wears his correction while flying, although that correction gives him normal vision in each eye, whereas when uncorrected the vision of the better eye is in one 6/9, and in the other two 6/12, the vision of the worse eye being 6/18, 6/36, and 6/12 respectively. In the one who has an eye with only 6/36 there is imperfect binocular vision with a slight divergence.

It is obvious that successful flying can quite well be done with distant vision slightly below the normal. On the other hand, the necessity for quick and accurate reading of the dials of the various

instruments renders the possession of good near vision absolutely essential; and, in our opinion, a low myope whose vision binocularly was 6/12 would be, other things being equal, a more suitable candidate than a hypermetrope of any considerable degree, even though the distant vision of the latter was 6/5. We are not as yet in possession of sufficient knowledge of the effects of flying at high altitude on the accommodation to be dogmatic on the point, but it seems quite possible that the rapid accommodative effort necessary might not be available under such conditions.

It is not easy to define a satisfactory standard for binocular vision. Although it is a factor in the estimation of distance, it is not the only one, and many people who are not in possession of it judge distances with sufficient accuracy. Further information, derived from experience, would be necessary before laying down any rule on the matter.

Since more accidents occur through faulty landing than any other ordinary mistakes in flying, any defect of sight which might influence accurate judgment of position becomes of great importance. The possession of good binocular vision is certainly of great value in this connection. Successful landing is said to be almost instinctive, and certain aviators are stated to be unable to make good landings. It would be of great interest to know if in any such case binocular vision is defective.

All aviators with whom we have discussed the matter agree in the necessity for good colour vision. Signal lights have to be distinguished, particularly in making a night landing, and in ordinary observation work a colour-blind man may well make mistakes that might have most serious consequences.

Reaction time to visual impressions comes more under general than ocular examination. Small says that the French in their tests prefer the period to be in the neighbourhood of 19/100 of a second.

With the growing importance of night-flying the question of rapidity of dark adaptation needs discussion. After looking at the brightly illuminated dials of their instruments most aviators are unable to see anything outside for a considerable period. Some practical test of the rapidity with which the retina becomes dark adapted might be devised and found serviceable.

The present official standard for the R.F.C. is:—

Pilots—	Better eye	6/12	with correction	6/6.
„	Worse „	6/18	„	„	6/12.
Observers—	Better „	6/18	„	„	6/9.
„	Worse „	6/18	„	„	6/12.

Colour vision must be normal. The eyes must be free from disease.

The Re-education and Future of those Blinded in the War

A meeting of the Paris Ophthalmological Society on May 7, 1917, was devoted to discussing various points connected with those blinded in the war. Among other questions taken up by the meeting were the re-education and future of the blinded, night-blindness in soldiers, disorders of sight caused by cranial traumatisms, the improvement of ocular stumps in view of the wearing of an artificial eye, and the ocular signs of death.

Cosse, speaking of the re-education of those blinded in war, said it was but natural at first to follow the experience gained from those blinded in other ways. In that way reading and writing in Braille and the trades taught, including brush-, chair-, and basket-making, came to be adopted. The cleverness shown by the military blind, as well as their rapid progress, led to their employment in other capacities, and also permitted them to take up their former trade or profession and to live in their old residences. The blinded soldier had much to learn—how to walk and to guide himself and sometimes even how to eat. He was taught to read, write, and calculate in Braille, and in order to facilitate his relations with the sighted, he was also taught different ways of writing in black and even type-writing. His amusements were provided for by teaching him singing, music, cards, dominoes, and physical exercises. Certain trades which would be found useful in some regions, could be taught to the blind. Such employments were rope-making, cooperage, the making of straw-matting or of pearl tiaras, the polishing of glass stoppers, and so forth. Some kinds of agriculture, gardening, and the rearing of chickens had been taught to the blind. Special agricultural schools had been established, as, for example, the one at Sept-Fond.

Petit spoke of the necessity of sympathy between the blinded and the ophthalmic surgeon. Cantonnet described a method of writing for the blind which supplemented without superseding the Braille writing. Lagrange advocated an increased pension to those blinded in war rather than the indiscriminate bestowal of the Military Medal. Roche, who spoke somewhat pessimistically of the future of the blind, recommended organization. Vacher struck an essentially human note when he spoke of the necessity of visiting the military blinded in their homes. Cosse had observed mental disturbance in men both of whose eyes had been enucleated.

A conference was held in Paris from May 8 to May 12 last dealing with the war cripple. The meeting was divided into several sections, of which one was specially concerned with the difficulties of the blind, the deaf, and so on. Among the measures discussed and voted upon were the re-education and the return home of the blind soldier. It was proposed to carry out the treatment of the

blind as far as possible on the lines laid down by Saint Louis when he founded the Hospice des Quinze-Vingts, and allowed the blind beggars to live there with their families. The Conference advised that husbands and wives were not to be separated, but lodgings were to be found for them near their work.

Night-Blindness

At the meeting of the Paris Ophthalmological Society, Landolt distinguished between those who suffered from deficient vision at night prior to the war and those who were rendered night-blind as the result of the war. Among the night-blindness revealed by the war there was one group of cases, which he called nocturnal amblyopia, or false hemeralopia, made up for the most part of uncorrected, or badly corrected, ametropia, and of men affected with corneal lesions. A second group, true hemeralopia, included men with choroido-retinal lesions and some rare cases of retinitis pigmentosa, choroiditis, congenital affections of the neuro-retinal system, and of congenital night-blindness, probably physiological. The defect in the first group could be corrected by glasses, and the men kept at the front. In the second group some of the individuals concerned must be put on one side: for example, cases of pigmentary retinitis; some should be drafted into the auxiliary services, as those who combined poor sight with night-blindness; but most of them whose condition was congenital and definitive should be kept at the front, care being taken to notify their condition to the commanding officer. With regard to those rendered night-blind as the result of the war, the cases were very rare, but the condition should be easily cured. Symptoms may disappear after eight or ten days' rest and a suitable diet, including a couple of eggs a day. Cod liver oil, potassium iodide, strychnin, iron, and arsenic, have all been recommended. Fraenkel recommended Förster's photometer for detecting the simulation of night-blindness.

The Support of Artificial Eyes

Terrien believed that natural stumps, such as atrophic eyeballs, posterior segments, and the sclera retracted as the result of evisceration, are best fitted to bear an artificial eye. But they, as well as an optico-ciliary neurotomy, may be followed by sympathetic ophthalmitis. Enucleation should be completed by grafting into the capsule of Tenon a piece of costal cartilage and by suture of the recti muscles, previously detached from their insertions. He claimed that there was no danger of sympathetic ophthalmitis after this intervention. The prothesis after an ordinary enucleation might be improved by certain mechanical devices. Contracted sockets should be treated by progressive dilatation. Coulomb

admitted his preference for an eyeball shrunken to a quarter of its original size as a support for the artificial eye. Sourdille had had a case of sympathetic ophthalmitis after ablation of the anterior segment of the eyeball. In his opinion, exenteration should be reserved for recent wounds. He often inserted a graft of fat under the conjunctiva, sutured *en bourse*. Dor, in 22 patients who had lost one eye and complained of ocular irritation, found that among these cases the eye had been eviscerated in 21 and enucleated in 1. On the strength of these figures, he concluded that evisceration was less favourable than enucleation. Vacher thought that too many enucleations were done at the front, and that the cases might well wait some days. Magitot, when operating under unfavourable conditions, undertook in two stages the grafting of cartilage prepared in formol. Even under good conditions, the graft succeeded in only 60 per cent. of the cases. The grafting of a rabbit's eye had yielded Lagrange durable results. Kalt protested against plugging of the orbit after enucleation.

Ocular Signs of Death

Terson described the ocular signs, early and late, of death. The functional state of the pupils was very variable. Light acted slowly upon them for several hours after death, a remark that applied also to atropin and physostigmin. Electricity sometimes contracted the pupil five or six hours after death. As to the ophthalmo-reactions which involved the circulation, even injections of fluorescein did not always colour the human eye in the living. Cauterization, scraping (*raclage*), applications of copper sulphate, and subconjunctival injections of saline produced no redness in the still warm body, say, two hours after supposed death. Instillations of ether may be dangerous. Terson preferred to apply dionin, and if the application be made two hours after death no reaction followed.

These reactions may be of importance in cases of apparent death before rigidity or decomposition of the body has supervened.

ABSTRACTS

INJURIES OF THE EYE, ETC., IN WAR

(*Second Notice.*)

(1) **Weekers, L. (Liège).—Night-blindness in soldiers. (Héméralopie chez les soldats.)** *Arch. d'Ophtal.*, March-April, 1916.

(2) **Dantrelle.—Some cases of papillary stasis following war injuries. (De quelques cas de stase papillare consécutive à des blessures de guerre.)** *Arch. d'Ophtal.*, May-June, 1916.

(3) **Monbrun, A.—Alterations in the cervical sympathetic in war injuries of the eye and orbit. (Altérations du grand sympathique dans les blessures de guerre de l'œil et de l'orbite.)** *Arch. d'Ophtal.*, May-June, 1916.

(4) **Roche, Charles.—Paralysis of the cervical sympathetic in war wounds. (Les paralysies du sympathique cervical dans les blessures de guerre.)** *Arch. d'Ophtal.*, November-December, 1916.

(5) **Velter, E.—Clinical study of five cases of hemianopsia due to war injuries. (Etude clinique de cinq cas d'hémianopsie par blessure de guerre.)** *Arch. d'Ophtal.*, May-June, 1916.

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(7) **Yealland, Lewis R.—Case of gunshot wound involving visual centre, with visual disorientation.** *Proc. Royal Soc. Medicine, Section of Ophthal.*, July, 1916.

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(9) **van Schevensteen, A., *fils*.—Observations regarding factitious conjunctivitis. (Considérations sur les conjonctivites provoquées.)** *La Clinique Ophtal.*, October, 1916.

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(11) **Teulières, M. (Bordeaux), and Valois, G.—The action of asphyxiating or lacrymatory gas on the visual apparatus. (Action des gaz, asphyxiants ou lacrymogènes, sur l'appareil de la vision.)** *Arch. d'Ophtal.*, January-February, 1917.

(12) **Frenkel, Henri.—Traumatic subluxation of the crystalline lens. (Sur la subluxation du cristallin d'origine traumatique.)** *Arch. d'Ophtal.*, November-December, 1916.

(13) **Terrien, F. (Paris).—The repair of lesions of the conjunctiva and eyelids caused by wounds in war. (Réparation des lésions conjonctivales et palpébrales par blessures de guerre.)** *Arch. d'Ophtal.*, November-December, 1916.

(14) **Sourdille.—Ocular prothesis among those wounded in war. (Prothèse oculaire chez les blessés de guerre.)** *Arch. d'Ophtal.*, November-December, 1916.

(15) **Cousin, G.—On forms of sympathetic disease of early onset following injuries received in war. (De quelques formes précoces de réactions sympathiques à la suite des blessures de guerre.)** *Arch. d'Ophtal.*, November-December, 1916.

(16) **Harriet.—Traumatic posterior polar cataract. (Cataractes polaires postérieures, d'origine traumatique.)** *Arch. d'Ophtal.*, November-December, 1916.

(17) **Dor (Lyons).—Eight observations on unsuspected intra-ocular foreign bodies. (Huit observations de corps étrangers intra-oculaires ayant passé inaperçus.)** *La Clinique Ophtal.*, December, 1916.

(18) **Cunningham, J. F. (France).—Notes of some war wounds of the eye and orbit.** *Trans. Ophth. Soc. U.K.*, Vol. XXXVI (1916), p. 147.

(19) **Frenkel, Henri.—On folding of the retina in circles by contusion of the posterior segment (lesions of the retina by windage). (Sur le plissement en cercles de la rétine par contusion du segment postérieur [lésions de la rétine par "vent du boulet."])** *Ann. d'Ocul.*, T. CLIV, January, 1917.

(20) **Morax, V. (Paris).—Glaucoma secondary to wounds of the eye with intra-ocular foreign bodies. (Glaucome secondaire aux blessures du globe avec éclats intra-oculaires.)** *Ann. d'Ocul.*, T. CLIV, January, 1917.

(21) **Rollet (Lyons) and Velter.—Choroido-retinal lesions resulting from wounds in war. (Lésions chorio-rétiniennes par blessures de guerre.)** *Arch. d'Ophtal.*, January-February, 1917.

(22) **Ourgaud.—Destruction of a portion of the cornea in its whole thickness; restoration by conjunctival flap. (Large perte de substance de la cornée comprenant toute son épaisseur. Restauration par recouvrement conjonctival.)** *Arch. d'Ophtal.*, January-February, 1917.

(1) **Weekers** has been struck by the large number of cases of night-blindness he has met with in the Army. In January of 1915 the number of cases sent for ophthalmic examination was 95 out of a total of 496 patients, or over 19 per cent. All cases in which there was definite ocular lesion, such as retinitis pigmentosa, are excluded, and, with the exception of a rather large number of errors of refraction there was nothing local to account for the affection. The patients were in good health and well-nourished. The author believes he was able to exclude malingering; in fact some of the cases were officers who were very anxious lest their defect should interfere with promotion.

Weekers draws the following conclusions:—

1. Night-blindness is frequent among soldiers. It is met with in 10 per cent. of the cases sent for ophthalmic consultation.

2. Cases of night-blindness are particularly numerous in the winter months, when the nights are long.

3. Numerous cases of refractive errors are found among these patients.

4. Many of these soldiers suffered from similar trouble before the war (congenital night-blindness). Night-blindness can be produced by the conditions of trench life (acquired night-blindness). These same conditions may aggravate a congenital night-blindness.

5. The development of night-blindness is provoked by many factors of unequal importance. In the first place it is necessary to cite the abnormal character of trench life, which is above all nocturnal, the fatigue, the continual nervous shock, and the moral unrest leading to a greater or less degree of asthenia. The ocular fatigue resulting from refractive error is equally a very important factor. The uniformity of diet and use of preserved food may also play a part.

6. Treatment must be devoted to the cause. One of the most efficacious means of relieving the symptoms is the exact correction of refractive anomalies and particularly astigmatism. The use of smoked glasses during the day as a preventive of dazzling is an excellent adjuvant. A varied diet and rest, so far as military necessities will allow, should be ordered.

7. The prognosis is good. In spite of the complaints of the sufferers they can be kept at the front, with some special arrangements in the more marked cases.

E. E. H.

(2) **Dantrelle** has collected three interesting cases of papillœdema.

The first man was wounded in October by a shell fragment. Fragments of shell and bone were removed, and lumbar puncture was done several times. The man was sent back as cured, but referred to Dantrelle on account of visual trouble. He was found to have papillœdema on both sides, slightly more marked on the left. He suffered from obscurations of vision, lasting from two to ten minutes, and accompanied by vertigo and sweating. At other times his vision was practically normal. Radiography revealed one large and two small intracranial fragments of shell.

The second man was injured in the head by a bullet. Five months after, he suffered from meningeal symptoms with fever, which were thought to be due to tuberculous meningitis. Cerebro-spinal fluid, under pressure, contained a considerable quantity of albumen, and 0·65 gm. of sugar per litre. No tubercle bacilli were found, and inoculation of a guinea-pig was negative. He was trephined, and recovered. When seen by Dantrelle, he had a depressed and pulsating scar in the right superior frontal region. From time to time, what was

practically a cerebral hernia appeared in the scar, accompanied by severe headache and obscuration of vision. Papillary stasis marked and equal on both sides; vision normal. Radiography showed a bullet lying with its long axis transverse and horizontal in front of the chiasma, on the inferior face of the right frontal lobe.

The third patient was wounded in the lung by a bullet. As he fell he received a second blow on the head. He was not picked up for 36 hours. He suffered a good deal from severe headache, and some time later, when scratching the scar on his head, he detached a piece of shell. He was sent back to duty, and came under observation when trying to obtain a correction for his presbyopia. He had a pronounced typical papillœdema, somewhat more marked on the left side. The visual fields were slightly contracted, and the blind spot was enlarged. Lumbar puncture showed that the cerebro-spinal fluid was under pressure, and contained 1 gm. of sugar per litre. An intracranial fragment of shell was found by radiography. The patient refused further treatment. Nevertheless, the swelling gradually diminished and the vision remained normal.

These are the only three cases of papillœdema that Dantrelle has found among a large number of head injuries. He considers that in most of the cases of intracranial injury with retention of fragments, there exists such a large breach in the bony skull as to render the mechanical production of hypertension practically impossible.

E. E. H.

(3) Under this heading **Monbrun** has collected five cases, all of which had suffered from ruptured globe due to some projectile and which also had remaining a stump consisting of either of the back part of the eye due to imperfect enucleation or exenteration, or else a shrunken globe. In none was there any sign of inflammation about the stump, which was soundly healed. Symptoms did not appear till from three to fifteen months after the injury. The symptoms found consisted of severe burning pain, constantly present, radiating to the vertex and occipital regions. One of the sufferers had a region of cutaneous hyperæsthesia at the vertex with a sensation of twitching and pain (*tiraillement*), similar to that caused by the passage of an electric current. He also had a similar sensation at the level of the lower part of the thorax and epigastric regions.

All the patients presented considerable mental weakness. In addition to the constant sensation of heat, there was present redness of the face and ears, either complete or more or less limited to one side, together with sweating in the region affected with pain and redness. The least effort provoked exacerbation of all the symptoms.

In explaining these symptoms Monbrun quotes the work of other surgeons on similar symptoms observed in other parts of the body,

believed to be due to a neuritis of the sympathetic. Acting on this supposition, he removed the stump from two of his patients, but without benefit.

E. E. H.

(4) Claude Bernard, in 1858, and Horner, in 1861, wrote upon paralysis of the sympathetic; the former from experimental investigation, the latter from clinical observation. Hence the signs and symptoms of paralysis of the cervical sympathetic are known as the Claude Bernard-Horner syndrome.

Roche has collected records of 11 cases of paralysis of the cervical sympathetic following wounds received in war. Of these, 4 were under his own observation and hitherto unpublished. He has analysed the cases and gives a tabular statement showing which of the signs of sympathetic paralysis were present in each case. These signs are miosis, ptosis, enophthalmos, ocular hypotony, secretory disturbance, vasomotor disturbance.

It is interesting to note that not one of the 11 cases showed the complete syndrome. Miosis was present in every case; ptosis in 4; enophthalmos in 10; vasomotor disturbance in 6. In no case was the ocular pressure lowered.

The facts as to the nature and site of the wounds are briefly narrated below. The author points out that it is impossible to state with any certainty which ganglion or which branches of the sympathetic have been wounded. He suggests that the variation in the clinical features may bear a definite relation to the locality of the injury to the nervous chain.

CASE 1.—Wound by fragment of shell; cicatrix in front of left deltoid, near coracoid process; foreign body close to first costo-vertebral articulation.

CASE 2.—Wound of entry of bullet in middle of left malar region; wound of exit in nape of neck at level of fifth vertebra.

CASE 3.—Wound by fragment of shell, which entered the right carotid region, lacerating the sterno-mastoid. Fragment found among the cervical spinous processes and removed.

CASE 4.—Shell wound, the fragment entering in right lateral cervical region behind the sterno-mastoid. Fragment localized 1 cm. in front of the transverse process of the sixth vertebra.

CASE 5.—Shell wound; foreign body shown by X-rays close to the sixth cervical vertebra on the right side; a fragment of bone projecting into the medullary canal and pressing on the cord; in addition to the sympathetic paralysis, R. choked disc. Removal of the foreign body was followed by disappearance of the paralytic signs, and recovery of vision.

CASE 6.—Wound by fragment of shell 2 cm. behind and above the tip of the left mastoid; three fragments lodged under the left malar bone.

CASE 7.—Shell wound by several fragments; the largest lodged in right lateral cervical region.

CASE 8.—Bullet entered the right side of neck, perforated the sterno-mastoid near the clavicle, and lodged close to the eighth dorsal vertebra.

CASE 9.—Shrapnel bullet, entered at the posterior margin of the sterno-mastoid, 5 cm. from the mastoid process, penetrated the larynx and was expelled by coughing.

CASE 10.—Shell wound; the projectile entered right parotid region, and came out at the base of the skull posteriorly, close to the middle line.

CASE 11.—Wound by a fragment of shell in the right preauricular region, at the origin of the ascending ramus of the maxilla.

Roche points out that the usual explanation of the action of cocaine, as due to stimulation of the dilatator pupillæ fibres, is not consistent with the generally paralysing action of the drug. He prefers to explain its action as producing a paresis of the sphincter which, in normal conditions, allows the dilatator fibres to act, but that these latter fail to do so after destruction of the sympathetic. The probable seat of the lesion varies from the first to the sixth cervical ganglion, but the eye symptoms did not show any particular difference to correspond with the difference of level.

J. B. LAWFORD.

(5) **Velter** adds five more cases of hemianopsia to those already published resulting from war injury:

Case I had a very extensive lesion of the occipital lobe which presumably affected the optic radiations and cortical centre and resulted in a permanent homonymous right hemianopsia with preservation of macular vision.

Case II, also an extensive injury, when first seen had only telescopic vision. This first improved to a left homonymous hemianopsia, and, finally, to an homonymous defect limited to the left inferior quadrant. Velter considers that this was a partial lesion of the occipital lobe affecting the superior bundles of the optic radiations, or the superior lip of the calcarine fissure. The early double hemianopsia was probably due to contusion of the brain and pressure by clots.

Case III. The injury, which was due to a rifle ball fired at close range, involved the left lateral sinus. The projectile had rebounded and lodged in the left trapezius muscle. The visual fields at first were confined to central vision, improving to inferior horizontal hemianopsia, and, finally, to hemiachromatopsia in the right inferior quadrant. Velter considers that in spite of the extensive nature of the superficial injury, the encephalic lesion had been very slight, involving only the superior lip of the calcarine fissure. The earlier typical horizontal hemianopsia must have been due to a hæmorrhage situated between the cerebral hemispheres.

Case IV. Lesion less extensive. Total blindness for five hours, then homonymous right hemianopia which gradually became less, leaving a marked contraction of the colour fields but without any inversion.

Case V was that of a medical man who was injured by a shell fragment, which did not penetrate. Radiography showed irregularity of inner table with what looked like a sharp fragment in the neighbourhood of the cuneus. The visual fields showed a scotoma, absolute and symmetrical in the right superior quadrant of the macula. As in the similar cases described by Marie and Chatelin (*Revue Neurologique*, 1915, p. 882), the lesion in this case was very small, probably a simple puncture of the extreme point of the occipital lobe. Velter points out how these cases support the hypothesis of the localisation of macular projection to the posterior point of the occipital lobe. Reproductions of fields and photographs of the scars of the injuries accompany the paper. E. E. H.

(6) The wounds dealt with by **de Lapersonne** were inflicted with fragments of bombs, hand grenades, steel and nickel casing of bullets, copper fragments, morsels of earth, stone, and wood, and so forth. He speaks only of perforating wounds of the cornea or sclera with a wound of entry often scarcely visible. Of these injuries he had had among 1,000 wounded soldiers 191 under care. The wounds often give rise to very serious complications. Thus, among 191 cases, in 36·65 per cent. there were traumatic cataracts, with preservation of vision from 2/3 to 1/20; in 16·23 per cent. there was slight irido-cyclitis, with vision from 2/3 to 1/20; and in 47·12 per cent. there was complete loss of the eye from irido-cyclitis. The corneal wounds were rarely clean-cut, as in industrial injuries, and it was sometimes difficult to decide whether one or more perforations were present. They were often complicated by prolapse of the iris, lens, or organized vitreous. In perforating scleral wounds the points of entry might be concealed by chemosis or conjunctival injection, and diagnosis was made by the diminished intra-ocular pressure and by the loss of the contents of the anterior chamber. The intra-ocular lesions seen by de Lapersonne comprised: (1) hyphæma with tearing of the pupillary border of the iris, and hernia of the iris; (2) every variety of traumatic cataract. The presence of foreign bodies was frequent. The electro-magnet was useful only in the case of a magnetic foreign body. Radiography and radioscopy, however, were useful, even if the foreign body was not magnetic. Exact localization was generally difficult in the case of a non-magnetic body, and for war wounds was not very useful. de Lapersonne directs attention to the danger involved by the explosion of a projectile near the eye. Small penetrating wounds were produced, which became complicated with irido-cyclitis, and even threatened with sympathetic ophthalmitis.

Since the beginning of the war, de Lapersonne has not met with a single case of sympathetic ophthalmitis, and this is attributed to asepsis and better antisepsis, and there is also the fact that enucleation is more often performed when the first eye is lost or useless. Although the author has not met with definite sympathetic ophthalmitis in a sound eye, he has seen many cases where the two eyes being affected, irido-cyclitis occurs in the eye less affected, even if there has not been perforation.

Finally, the author has something to say about the means adopted for protecting the eye from wounds by small foreign bodies. He mentions the Adrian helmet, the masks and the *cagoules* with mica or cellophane spectacles, and the stereoscopic spectacles devised by Terrien and Lacan. These contrivances are tiresome for shooting with, and as they diminish luminosity, they cannot be employed at night. In de Lapersonne's opinion, the spectacles with more or less solid wire grating, lined with a leaf of cellophane, are the best; they can be worn like motor goggles, and are vapour-tight enough to keep off lacrymatory gas.

S. S.

(7) **Yealland** reports the following case: After a perforated bullet wound of the skull, a soldier, aged 31 years, developed several nervous signs and symptoms, such as right hemiplegia, left hemianopia, contraction of the visual fields, and some degree of apraxia. Visual disorientation was also present, so that the patient could not tell the relation of objects in space. An object lying to his left usually appeared to be nearer to him than one to his right. It was believed that the whole visuo-sensory cortex on the right side had been destroyed by the injury.

S. S.

(8) *See* THE BRITISH JOURNAL OF OPHTHALMOLOGY, No. 2, p. 121.

(9) The article by **van Schevensteen**, of the Belgian Army, is of great interest, dealing, as it does, with a form of malingering which apparently must be rather common. The author refers to two types, namely: (1) where the provocative agent is ipecacuanha powder, and (2) where the agent cannot be exactly identified. In the former case the symptoms are due to the action of the alkaloid emetine. This produces two forms of conjunctivitis, according to whether the powder is introduced once or repeatedly. That is, it causes either an acute or a chronic conjunctivitis. One gathers from what the author says, that after a little experience, one cannot mistake these forms of conjunctivitis for others caused by pathogenic organisms.

In the acute forms there is often a unilateral conjunctivitis which begins suddenly, with violent irritation from the very start. There is considerable swelling of the conjunctiva of the

turgid lower *cul-de-sac*. Secretion is minimal, sometimes forming a pseudo-membranous layer. The eyelids cannot be opened spontaneously. The surrounding parts have an erysipelatous appearance.

In the chronic forms the unilateral type is frequent, the lesion is confined to the lower *cul-de-sac*. The conjunctiva is smooth, with deep folds, and the vascular tracery is lost. This smooth conjunctiva has a peculiar salmon tint. Sometimes the upper palpebral conjunctiva is involved. Secretion is minimal. The bulbar conjunctiva has a peculiar propensity to redden on handling the eye and on the employment of every kind of collyrium. The history, the unlikely causes invoked for the affection, its course and long duration, and its resistance to all kinds of treatment are all points which should not be neglected, while, finally, the clinical diagnosis may be corroborated by the discovery of ipecacuanha. By special methods ipecacuanha may be found microscopically, but the author says the diagnosis is so clear clinically that this is not necessary.

The differential diagnosis from blennorrhœal conjunctivitis, trachoma, and diphtheritic conjunctivitis is then gone over in detail. Regarding the first, the principal point is the absence of the gonococcus from the conjunctiva and urethra. As to trachoma, it apparently occasionally happens that something resembling trachoma follicles may be seen at the upper border of the tarsus, but the application of an occlusive collodion-fixed dressing results in their disappearance. The resemblance to diphtheritic conjunctivitis can be brushed aside. The false membrane is quite different and there are none of the usual symptoms, nor swelling of the preauricular gland. Similar considerations apply to Parinaud's conjunctivitis and to the streptococcic variety. If there is ever a slight doubt regarding other kinds of catarrhal conjunctivitis just at the onset, the course taken by ipecacuanha conjunctivitis, its peculiar lesions, and especially the salmon tint of the lower conjunctiva are characteristic. Treatment is easy and essentially consists in getting rid of the use of ipecacuanha. For the acute initial symptoms, an antiseptic dressing, and a little atropine should there be a corneal lesion. The collodion-fixed dressing has given the author excellent results where either ipecacuanha or other agents for the production of conjunctivitis are in question. This is left in place for several days, when the symptoms are found to have disappeared.

Besides ipecacuanha other chemical agents may produce just as strange forms of conjunctival inflammation, but of these, such as podophyllin, jequirity, cantharides, and chrysarobin, the author has not had special experience. All his cases of this type have been caused by ipecacuanha.

Regarding the author's second heading, cases, that is, in which the causative agent cannot be exactly ascertained, he suggests the

different points in the diagnosis from a spontaneously caused condition. These points are: (1) bilaterality is usual, (2) chronicity, torpidity and resistance to treatment, (3) lividity of the *cul-de-sac*, and sometimes pseudo-follicles at the upper border of the tarsus, (4) "paradoxical" secretion, *i.e.*, plenty of secretion at the usual morning visit, but very little if a surprise visit is made and (5) anomalous and uncertain causes offered in explanation of the symptoms. Among the agents of such anomalous forms of conjunctivitis may be mentioned soap, tobacco powder and juice, pepper, tartar from the teeth, and other strange and often dirty things.

ERNEST THOMSON.

(10) The conclusions come to by **Gremeaux**, of the French Army, are as follow:—

The lacrymatory gases employed up to now by the Germans cause ocular troubles, which are confined to a more or less violent conjunctival reaction, always accompanied by exfoliation of the limbal corneal tissue. These lesions rapidly attain their maximum extent, and when the wounded individual can be attended to soon afterwards, they remain quite limited and progress towards cure under appropriate treatment. For a given strength of gas the time of exposure of the eyes to it seems to have no influence whatever, either as regards the intensity of the symptoms or the ultimate course. The intense lacrymation determined by the action of lacrymatory gas, on the one hand, and the occlusive palpebral reflex, on the other hand, seem to account sufficiently for the foregoing facts, in that the eye is thus mechanically protected.

The treatment of these cases is as follows:—The occlusive bandage must not be worn. Mild lotions to be used. The pupil to be kept dilated, watching the tension. Every second day 1 per cent. zinc sulphate to be instilled. Potato starch poultices in frequency according to the intensity of the hyperæmia. A "floating" bandage to protect from light, while leaving the eye uncovered. No cocaine, of any degree of dilution whatever, is to be employed, as the epithelium is already rendered friable by the action of the gas.

ERNEST THOMSON.

(11) **Teulières** and **Valois**, who are in charge of the Ophthalmic Centre of the 13th Military Area, receive their patients two to three days after their exposure to gas attacks. They believe this explains their inability to establish any differences between the effects of gas projected in clouds from the enemy lines and of that set free by the bursting of "lacrymatory" shells.

The subjective symptoms are constant, and are those common to all cases of violent irritation of the conjunctiva, very severe smarting and pricking sensations, blepharospasm and photophobia. These symptoms last for a considerable time. In a large number of the cases, when this first phase of irritation has passed and the eyes can

be opened, the visual acuity has been found considerably reduced; but in no instance has restriction of, or scotomata in, the field, or dyschromatopsia been observed.

The following lesions have been noted:—

Eyelids.—Burns of the lid margins caused by the gas and aggravated by the incessant flow of tears, macerating the raw surface. Oedema of lids.

Lacrymal apparatus.—Lacrymation, often excessive, but unaccompanied by other lesions.

Conjunctiva.—Congestion of this membrane, most noticeable near the limbus; slight chemosis.

Iris.—The changes in this structure are noteworthy. Most frequently the colour is modified, becoming less vivid; the surface has a flocculent (*tomenteux*) appearance. The pupil reacts sluggishly to light, and slowly to mydriatics; several applications of atropine are necessary to produce dilatation. This paretic condition of the iris is generally long continued. These changes are indicative of severe congestion of the iris; posterior synechiæ have not been observed.

Posterior segment of the eye.—No disturbance in the transparent media has been noted.

The lesions of the deeper parts are limited to the optic disc and the retina. A mild degree of neuro-retinitis is present in many cases. The papilla is blurred, with ill-defined margins; sometimes there is slight loss of colour, especially noticeable in the temporal part.

Around the disc the retina undergoes a peculiar but always similar change, becoming *slate-coloured*. This alteration in colour is thought to be due to œdema; it is not limited to the immediate vicinity of the disc, but extends along the large retinal vessels. The retinal veins are dilated, and often tortuous; the calibre of the arteries is unaltered.

These signs are always coincident with diminution of visual acuity, the loss in one case reaching 8/10.

The authors discuss the ætiology of these neuro-retinal lesions; they are not satisfied with the suggestion that the deeper lesions are merely an extension of the congestion phenomena noted in the anterior parts of the eye. Their view is rather that the inhalation of these noxious gases induces a severe reaction in the mucous membranes of the nasal cavities and of all the accessory sinuses, and that by this path and the cribriform lamina of the ethmoid the meninges of the optic nerves may be directly involved.

In all the cases, save one, under the observation of the writers, complete recovery ensued. In the exceptional case, after the neuro-retinal changes had disappeared, vision in each eye was only 0·3 at the time the patient was discharged from hospital.

The authors' experience of these "gassed" patients justifies a wholly favourable prognosis.

J. B. LAWFORD.

(12) **Frenkel** is of opinion that subluxation of the lens as a result of injury is much more common than is generally supposed. He groups cases under two headings: (*a*) typical cases, in the diagnosis of which there is uncertainty; (*b*) atypical cases, difficult to diagnose, and in which the following are the most valuable signs :—

(1) The existence of a fold in the iris concentric with the circulus arteriosus major, and limited to a portion of the circumference. This fold is shown by a single (sometimes double) line produced by the close apposition of the iris to the edge of the subluxated lens; (2) diminution of the pupillary reflexes, and partial mydriasis; (3) corectopia: this, if bilateral, is usually congenital, if unilateral, is almost always acquired; (4) minute tears in the iris, near the root, or in the sphincter area: they are frequently so small as to be easily overlooked; (5) retroversion of the iris at the free edge of an irido-dialysis; (6) partial traumatic cataract; and (7) acquired myopia or hypermetropia.

Three varieties of subluxation are described: (*a*) with rotation of the lens on an equatorial axis; (*b*) with displacement of the lens backwards; (*c*) with displacement forwards. The third variety (*c*) is that most frequently overlooked.

The proportion of cases of subluxation among the wounded at the Ophthalmic Centre of Toulouse was, in 1915, two per cent. in a total of 547 ; in 1916, seven per cent. in a total of 518.

J. B. LAWFORD.

(13) Apart from its intrinsic interest, this paper by **Terrien** merits notice as a contribution based on a large war experience of wounds of the eyelids and orbit, for the repair of which plastic operations were undertaken. It is a paper which unfortunately does not lend itself to review. Only one case is described, and that briefly, in which a plastic operation restored an upper lid almost completely destroyed by shell wound and enabled the patient to wear an artificial eye.

In the rest of the paper the writer discusses the merits of the varieties of flap which he has employed; the sliding flap, the flap with pedicle, and cutaneous and conjunctival grafts. He seems to favour the use of pedunculated flaps from the immediate vicinity of the eyelids, whenever possible; but in cases of extensive wounds or cicatrices for which large flaps are necessary, he has had recourse to the Italian method, and has taken a flap from the arm, liberating it from its pedicle about the twelfth day.

For cases of total symblepharon he has employed skin grafts; these he has taken from situations where the skin is thin, e.g., the

inner surface of the arm, or behind the ear; they should be free from subcutaneous cellular tissue. The adherent lid having been detached in its whole length and breadth from the orbital cavity (presumably he refers to cases in which the globe has been destroyed) and a *cul-de-sac* constructed, the flap, measuring about one quarter more than the prepared area, is sutured into place, care being observed to obtain the most accurate co-aptation possible. The stitches are removed from the sixth to the eighth day, and an artificial eye is inserted about the third week.

The author has some fear of late shrinking of these flaps, and, when possible, gives preference in such cases to a pedicle-flap taken from the temporal region.

J. B. LAWFORD.

(14) The vast number of cases of wounds of the eyeball and adjoining structures, among the fighting forces, has provided ample opportunity to **Sourdille** to evolve operative methods by which a satisfactory ocular prothesis may be obtained. He divides his cases into: (1) those in which the wound is limited to the eyeball; (2) those in which the injury to the eye is complicated by palpebro-conjunctival or orbital lesions.

In the first group he advises exenteration, if it can be done not later than the third or fourth day after the wound. In the men reaching the base hospital the wounded eye, in many instances, is already attacked by irido-cyclitis, and in some contains a foreign body. These eyes are unsuitable for any operation, except enucleation.

The author is dissatisfied with the prothesis obtainable after simple excision of the globe, and has therefore devised and practised an operation which he calls "plastic enucleation," and which has so far, especially in his later cases, given a very satisfactory result. He has, in all his nine cases, employed general anæsthesia. The steps of the procedure are as follows:—

1. The conjunctiva is divided at the limbus and dissected up as far as the recti tendons.

2. Each rectus tendon is seized by forceps, and cut through at its attachment; a silk suture (on two curved needles) is passed through the tendon and the conjunctiva over it. These threads are secured in a clamp forceps.

3. The globe is removed, and a plug soaked in dioxide is inserted into the cavity and light pressure applied to arrest hæmorrhage.

4. A circular piece of skin, 28 to 30 mm. in diameter, and including a thin layer of fat, is taken from the buttock.

5. This graft is introduced into Tenon's capsule and fixed by the threads already in the recti tendons. Additional stitches between these attach the conjunctiva to the graft.

6. A light compressive bandage is applied. The stitches are removed on the seventh or eighth day.

The resulting stump is resistent, sufficiently prominent, and very mobile.

Cases in the second group, in which there is damage to or destruction of the eyelids, or portions of the orbital margin of wall, will often tax the skill and ingenuity of the surgeon to the utmost. No definite line of treatment can be laid down. Plastic operations, frequently repeated, may be necessary and in many instances months may elapse before the final result is attained. In some cases where the malar bone or outer wall of the orbit has been destroyed, the author has made use of bony grafts taken from the surface of the external malleolus. He urges that surgeons at the front should devote greater care to the early treatment of wounds, lacerations, and displacements of the periorbital tissues; such lesions, if neglected in the early stage, lead to deformities which, in the cicatricial stage, may be almost irremediable.

J. B. LAWFORD.

(15) **Cousin,** in common with other surgeons, holds that there exists a group of signs, which cannot be accurately described as sympathetic ophthalmitis, but which should be carefully differentiated from "sympathetic irritation." He would place cases presenting these signs in a category apart from those of true sympathetic inflammation and those of sympathetic irritation. Examples of this "sympathetic reaction," as the writer terms it, have occurred not infrequently among the wounded of the French Army.

In the *wounded eye* the symptoms are pain, tenderness on pressure, lacrymation, conjunctival injection. Photophobia is a less constant symptom. These symptoms date usually from the time of the injury, which in most cases is a perforating wound, and persist after cicatrisation is complete. The pain is usually persistent, although not severe, and is occasionally liable to short exacerbations. Pain and tenderness have never been absent from the cases under the author's observation. Lacrymation and conjunctival injection vary greatly in degree.

In the *unwounded eye,* the symptoms present considerable resemblance to those already described, but are, as a rule, less marked. Their onset is later; in some instances 36 to 48 hours, but more commonly seven to ten days after the injury.

The writer mentions four symptoms as characteristic: photophobia, lacrymation, discomfort in reading, slight lowering of visual acuity. Photophobia is the most frequent symptom, and is usually well-marked, but relieved by the use of tinted glasses. Lacrymation is of very variable intensity. Discomfort induced by reading, or by any occupation requiring accurate and prolonged use of the eye, is often the symptom which leads the patient to seek advice.

The loss in visual acuity, always slight, is difficult to estimate accurately; in most cases no record of the vision before the accident

is obtainable. Cousin states that he has found a reduction in acuity varying from 1/10 to 5/10. Ophthalmoscopic signs are negative; pain is absent.

These symptoms, while resistent to ameliorative treatment, all disappear shortly after removal of the wounded eye; the defect in vision being the most tardy. Enucleation of the wounded eye is the treatment recommended. Notes of eight cases are included in the paper.

J. B. LAWFORD.

(16) The author describes in detail two cases of unilateral posterior polar cataract in soldiers, following the explosion of a shell a few metres from them. The two men were close together at the time. They were examined by **Harriet** nine days later. In each patient there was no sign of wound of the eyeball; in one there was a small superficial scar at the lower border of the orbit near the nose; in the other there was no evidence of wound of the face or head. The men were knocked over by the explosion, and said that they felt as if the injured eye had been severely scalded.

In each case there was persistent traumatic mydriasis, and a stellate opacity at the posterior pole of the lens; at a later date the lens became opaque throughout in both patients.

Harriet publishes these cases as examples of cataract caused by the shock of the explosion, i.e., by the impact of aerial waves. The absence of all evidence as to the conditions present immediately, or shortly, after the injury, renders it difficult to accept his view of the ætiology as the most probable.

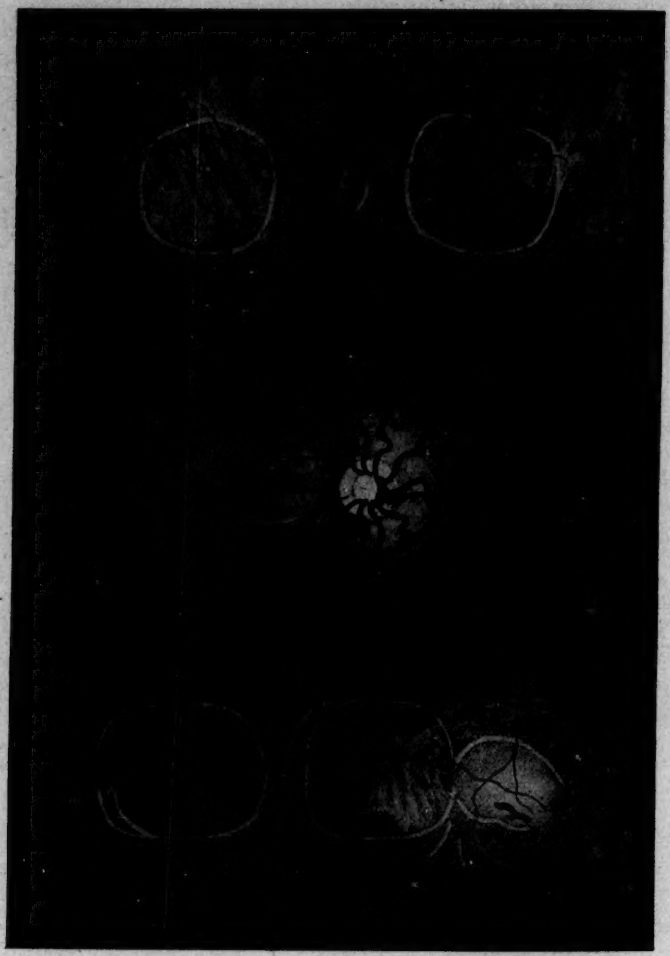
J. B. LAWFORD.

(17) **Dor**, now stationed at Nancy, reports the details of eight cases, out of a total of about thirty seen by him during six months, in which the foreign body had not been diagnosed. In two of them vision could have been preserved if the diagnosis had been made. It is curious that four of these cases had been examined by specialists, and, more than that, one of them had been seen by three, and another by no fewer than five specialists. The only comment Dor makes, apart from the hint that the foreign bodies ought to have been diagnosed, is that the mistake is only possible when the foreign body has passed through the sclera, since wounds of this membrane close in two or three days and leave only the most trifling cicatrices.

ERNEST THOMSON.

(19) In the present illustrated article, **Frenkel** submits a somewhat unique clinical picture which he has come across in the course of his military medical work, and which he ventures to attribute to the effects of windage. He quite realises the difficulty that exists in establishing the diagnosis of such cases, for one must take care not to attribute to windage any case in which a more solid body may have been operative. The present case, moreover, is certainly

less convincing by the facts, first, that the Wassermann blood reaction had been found positive nearly eleven months before Frenkel examined the case; and, secondly, that Frenkel did not



see the patient until nineteen months after the date of the alleged injury.

On February 17, 1915, a sergeant of infantry was buried as a result of successive burstings of many "tear" shells, a particular shell having burst on the parapet about two metres in front of him. Although "blinded" by the gas and the dust, he could still

distinguish objects when extricated, and was able to keep on duty, and did so till September 14, 1915, when he reported a dimness of sight in the right eye as having been noticed almost at once after the shell-burst on February 17. By various stages he reached Rouen on October 8, 1915, where the diagnosis was made of "unequal pupils and optic neuritis." On October 28 the left eye was noted as normal, while the right showed vitreous opacities with exudates and foci of choroido-retinitis in the lower part of retina. Wassermann +; treatment by iodide of mercury. By November 29 he had had sixteen injections, and a few days later could tell the form of the hand. It was not till September 14, 1916, that Frenkel saw the case, when he noted that there was no sign of external wound, no lesion or affection of the cranial nerves, and that hearing was normal. The right eye was slightly divergent, and the pupil reacted to light, feebly directly, but normally consensually; pupils equal; media clear. Peculiar fundus appearances, shown in Figure, as follows.—Right optic disc has kept its rosy hue, except the temporal sector, which is slightly greyish; all the retina above papilla seems raised, but its colour is quite normal and rosy, the upper arteries appearing to be raised with the retina; in the lower macular region is seen a whitish line, parallel to the inferior temporal artery, concave upwards, having the form of the arc of an ellipse, length two disc diameters, with a reddish reflex on the convex side; macula apparently normal. At the periphery of the retina special changes: (a) in the upper-outer quadrant a white line, definitely circular, of retinal folding, diameter, judged from the drawing, about two-and-a-half times that of the disc, enclosing normal retina save for four or five whitish dots at the upper part; (b) in lower-outer quadrant a rather larger similar area, only rather more oval than circular; (c) in lower portion of retina another ovoid area, with a partly resolved hæmorrhage at its lower part and some whitish discolouration of retina; (d) below and to inner side another, incomplete, ovoid area, with a hæmorrhage near its lower edge, close to arterial twigs; (e) in the upper-inner quadrant another ovoid area without hæmorrhage, but with three whitish flecks due to resolved hæmorrhage: (f) the three lower areas are contiguous, while between the two upper ones is a suggestion of a small ovoid area with a whitish tick in its centre. R.V.=fingers at 30 cm., colour perception absent, field of vision from fusion of peripheral and central scotomata, has the form of a horse-shoe concave next the centre, extending from 30 to 40 degrees, in which belt white is perceived but not colours. Left eye: normal vision, colour perception, and field.

Frenkel says the interpretation of the peculiar fundus appearances does not appear to present any difficulties. His view of the case is that the displacement of air by the bursting, only two metres away,

of the shell, had been enough to compress the right eyeball backwards into the orbit, the left eye, as he says, having probably been out of the sphere of action of the air waves. The right eyeball thus came violently in contact at five points, two above and three below, with the bony orbit, the disposition of the orbital walls allowing one to accept five points of contact between globe and bony surfaces. The slope of the bony walls has caused the areas to be oval and not circular, as they would have been otherwise. When the air pressure eased off, the dimpled-in sclerotic recovered, but the retina, folded or crinkled at the edges of the scleral depressions, retained the appearances noted by the ophthalmoscope. Frenkel argues against its being direct concussion from earth, and holds that to produce these unique fundus changes any force must be instantaneous, of short duration and great intensity—conditions more likely to be got from air than from earth pressure.

Frenkel refers to cases from the literature of retinal hæmorrhages, vitreous hæmorrhages, retinal detachment, lens dislocation, serous choroiditis with secondary glaucoma, progressive myopia with macular choroido-retinitis, and that unconvincing group of the psycho-neuroses with blindness—all attributed to windage.

The article is furnished with a drawing of the fundus (reproduced in this abstract), charts of the fields, and a diagram to show the five points of pressure in the orbital walls.

No mention is made of the degree of prominence of the retina within the several areas, as estimated by the ophthalmoscope, nor is any explanation vouchsafed for the very defective central vision in the right eye.

W. C. SOUTER.

(20) **Morax** considers that he is dealing here with a definite clinical entity, for although he had seen but one case of this sort in civil practice, and that a case of siderosis, he has met with five cases amongst a thousand wounded in the present war. He puts on one side cases of glaucoma secondary to irido-cyclitis after perforating injuries, with or without an intra-ocular foreign body, cases of glaucoma secondary to the rapid development of a traumatic cataract, or to a contusion of the globe with dislocation of the lens. In his cases there has been an extremely fine penetration through sclera alone, or through cornea, iris, and lens, with greater or less involvement of vision. The presence of the foreign body may or may not have been recognized. The early reaction has long subsided, and it may be many weeks or months after the wounding when fresh developments cause attention to be directed to the eye. The cases may be acute, subacute, or chronic as regards their increased tension. Very few such cases are to be met with in the literature. In most of Morax's cases the entrance wound has been very slight, and might easily have been missed. The foreign body has been

TABLE OF CASES OF GLAUCOMA SECONDARY TO INTRA-OCULAR FOREIGN BODIES.

Authors.	Morax.	Morax.	Morax.	Morax.	Morax.	Hirschberg.	Cramer.	Hirschberg.	Gilbert.	Erdmann.
Age	19	25	30	30	31	?	38	46	47	?
F.B.	Iron	Iron	? Stone	?	?	Iron	Iron	Iron	Iron	Iron
Entrance	Cil.scl.	Corneal	Scl.	?	Cil.-scl.	?	Corneal	Corneal	?	?
Duration of sojourn of F.B.	4 months	1 month	4½ months	2½ months	7 months	20 years	5 weeks	2 years	21 years	6 months
Operation before Glaucoma found	—	—	—	Extraction simple	Extraction simple	—	Extraction of F.B. and of lens	—	Iridectomy Extraction of lens	Extraction of F.B. electro-magnet
Glaucoma	Subacute V=5/15	Acute	Sub-acute	Chronic	Chronic	Chronic	Acute 1 year after extraction	Chronic absol.	Chronic	Acute
Treatment	Extraction of magnetic chip. Iridectomy	Extraction of lens. Extraction of magnetic chip. Iridectomy	Enucleation	Extraction of lens. Sclerectomy anterior; sclerecto-iridectomy	Piloc.	Iridectomy	Iridectomy	Enucleation	Enucleation	Iridectomy
Result...	V.=hand movements; pain gone.	V.=fingers at 30 cm. T.=0	—	T.=40mm. V.=p.l.	Eye quiet	Bad result	V.=1/10	—	—	V.=2/3

established by extraction or by radioscopy, and the glaucomatous state has preceded all operative interference. There have been attacks of glaucoma, in which the tension, originally 40 to 60 mm. Hg., had shot up to 60 and 80 mm. with consequent congestion and pain; and others with lower degrees of tension, about 30 to 40 mm. Hg., where attention was directed to the tension because of a poor visual result with a clear pupil. Miotics seem of little value in keeping down the tension in these cases. There was small likelihood of these cases being predisposed to glaucoma, as might be suggested, for they were all young, and in every case one eye only was affected. Morax says that the part played by contusion in his cases was quite negligible, as the smallness of the scleral wounds indicates; but in the notes of his cases, No. 1 had a rupture of choroid, with hæmorrhages about it, and a foreign body weighing 27 milligrammes; No. 3 showed the "fundus changes, pigmentary and atrophic, which accompany traumatic alterations of the choroid and retina," and in the enucleated eye was found a very small piece of stone, weight not stated; in two other cases the fundus appearances were either not made out or not recorded.

The foreign body need not be of iron to cause the glaucoma, and it may be aseptic and still cause tension, just as a dislocated lens may, although Morax does not desire to push this analogy too far. None of the cases showed signs of cyclitis, so that there was probably not any torpid affection of the ciliary body.

Treatment seems most unsatisfactory from the functional side, while it may relieve pain. One is driven to enucleation or evisceration, if the extraction of the foreign body, miotics, sclerecto-iridectomy, and anterior and posterior sclerotomies fail. Morax strongly advises careful observation of the tension in all cases of intra-ocular foreign bodies as a complement to radioscopy and radiography, and further calls for a more extended use in early cases of the electro-magnet.

His table includes several cases from the literature, as well as his own five now recorded. The most striking point is the bad result obtained in almost every case.

W. C. SOUTER.

(21) At the Ophthalmic Centre of the 14th Military Area, 3,915 wounded were treated up to December 31, 1916. Of this number there were 343 cases of lesions of the deep tunics of the eye, without disorganization of the eyeball, a percentage of 8·76. The authors exclude from this list lesions produced by intra-ocular foreign bodies, cases in which the vitreous is filled by blood and no view of the fundus is obtainable, and wounds of the anterior segment of the globe (iridodialysis with hyphæma, traumatic cataract, etc.) in which the existence of fundus lesions is conjectural.

In 145 of the total number the impact of the projectile was upon the eyeball, *choc direct*. In 128 the impact was upon adjoining structures, *choc indirect*:—

The malar region	was involved	in	34 cases
The outer end of the eyebrow	„	„	28 „
The temporal region	„	„	24 „
The infra-orbital region	„	„	22 „
The frontal region	„	„	19 „
The mastoid region	„	„	1 case

In 22 cases the exact site of the wound could not be determined; in 24 cases there were multiple wounds. In 22 cases the ocular lesions were due to the passage of bullets through the facial structures; of these the greater number involved the temporal region, the outer margin of the orbit, the malar and superior maxillary bones.

The authors draw attention to instances of fundus lesions in men exposed to the explosion of a shell at a short distance, in whom no wound of the eyeball or surrounding structures is discoverable. Terrien has noted some cases of this kind and **Rollet** and **Velter** have had one such under observation. They attribute the choroidal lesion (rupture) to the force of the air concussion.

Although the diversity of the lesions observed renders it difficult to classify them, the authors have grouped their cases under the following headings:—

1. Detachment of retina of all grades, 43 cases.
2. Detachment with exudation, resulting in proliferating retinitis, or the formation of cicatricial bands, 37 cases.
3. Rupture of the choroid, 133 cases. The variation in the extent and position of the ruptures is in noticeable contrast to the usual crescentic lesions at the posterior pole, met with in the accidents of civil life.
4. Choroido-retinal hæmorrhage and resulting changes, 130 cases, of which 38 were examples of hæmorrhage in the macular area.
5. Concomitant lesions of the papilla. These have been noted in about one-third of the cases of rupture and hæmorrhage at the posterior pole. They have included simple hyperæmia of the papilla, well-marked papillitis, atrophy of the papilla in varying degree, and complete obliteration of the papilla.

The prognosis in cases such as those under consideration is naturally most uncertain. The lesions are slow in healing, and much time must elapse before the final stage is reached. In a certain number, however, in which the macula has not been irremediably damaged, a considerable and quite useful degree of vision may be ultimately regained.

The paper is accompanied by a plate of six coloured drawings of choroido-retinal lesions.

J. B. LAWFORD.

(22) **Ourgaud** reports a case in which, as the result of a shell wound, the lower fourth of the cornea was destroyed; the gap was occupied by iris; there was traumatic cataract.

The day following the wound the conjunctiva was divided at the limbus in the whole circumference, the jagged edges of the corneal wound were cauterized, the conjunctiva was drawn over the cornea and its edges were united by a transverse suture. Seven days later the stitches were removed, and the upper portion of the conjunctiva began to retract. Two weeks later the upper flap of conjunctiva was in its normal position. The lower part was firmly adherent to the margins of the wound, forming a large opaque patch over the inferior half of the cornea. This area protruded slightly, but in four months the prominence had entirely disappeared. The loss of corneal tissue appeared to be completely replaced. Tension normal. An upward iridectomy and extraction of the cataract were subsequently performed. The resulting vision was finger-counting at 30 cm. with a + 10 D. lens.

J. B. LAWFORD.

BOOK NOTICE

Les Fractures de l'Orbite par Projectiles de Guerre. By FELIX LAGRANGE, Professor in the Faculty of Medicine, Bordeaux. With 6 plates and 77 figures in the text. Paris: Masson et Cie. Price, 4 francs. 1917.

Messrs. Masson and Co. are issuing a series of "Précis de Médecine et de Chirurgie de Guerre." Eighteen volumes have already appeared and others are announced. They give an excellent account of the methods of French medicine and surgery for dealing with the disabilities produced by the war, concise, well written, and admirably illustrated. Professor Lagrange has contributed a volume on injuries of the orbit. His title is somewhat misleading, for a large proportion of his book deals with injuries of the eyeball itself, whether incidental to fractures of the orbit or not.

The first chapter is devoted to a short historical account of war injuries to the eye and neighbouring parts, ranging from Homer to a Madrid thesis of 1916. It occupies nine pages, cites a few French and German authors, and is the least satisfactory part of the book.

The second chapter contains a brief account of the anatomy of the orbit, the resistance of its base and walls to traumatism, the application of the laws of dynamics to the orbit, and its vulnerability.

The third chapter gives statistics derived from the Base Hospital to which Professor Lagrange is attached, and considers the general question of the ætiology of fractures of the orbit. One important

conclusion may be quoted. "Fractures of the cranial vault caused by projectiles do not extend by radiation into the roof of the orbit and do not cause fractures by contre-coup." Fractures of the roof of the orbit and of the optic foramen result from falls or violent blows on the vertex of the skull, falls on the feet or direct injury.

The fourth chapter, discussing fractures of the orbit with conservation of the eyeball, is the most valuable part of the book. It records the author's own observations, experiences and deductions, which are supported by protocols of cases, illustrated by admirably clear diagrams and half-tone drawings of fundus conditions. The cases are classified in two categories, those without and those with retained foreign body. The former are divided into five groups: (1) The projectile passes above the orbit, causing fracture of the roof by radiation or contre-coup. The optic nerve is often injured and atrophies, and enophthalmos is not uncommon, attributed by the author to paralysis of the sympathetic. (2) The projectile passes below the orbit or orbits. The ocular lesions are chiefly at the posterior pole, especially hæmorrhages in and about the macula. They are attributed to transmission of vibrations to the orbital contents, the orbital fat being nearly liquid at the body temperature. (3) The projectile fractures one wall of the orbit without touching the globe. In addition to macular lesions there are large choroidal ruptures, and often ruptures of both choroid and retina, situated on the side of the fundus nearest the fracture. (4) The projectile traverses the orbit without touching the globe. Sometimes both orbits are traversed. The optic nerve is wounded or cut across and there is often partial tearing away of the nerve at the disc. (5) The projectile touches the globe tangentially in its transit. The lesions are at the site of contact and consist of ruptures of the choroid and retina, which radiate in all directions but principally towards the posterior pole.

Professor Lagrange describes and comments on the various lesions of the eyeball seriatim. We can only mention a few of his more noteworthy observations. Thus, in cases in which there is reason to suspect hæmorrhage into the sheath of the optic nerve, he has never observed hæmorrhage around the disc, as has been described, but sometimes, long after the injury, a brownish pigmented ring. He has never seen an ordinary rupture of the sclerotic, i.e., just outside and concentric with the limbus, amongst war injuries. The frequency of ruptures of both choroid and retina, rare in civil life, is rightly emphasized, the inevitable consequence—large masses of cicatricial tissue, "traumatic chorio-retinitis proliferans"—described, and the points of distinction from ordinary retinitis proliferans tabulated. The number of simple detachments of the retina is said not to be very considerable. This infrequency in war injuries has been noticed by British ophthalmologists.

The fifth chapter discusses fractures of the orbit with destruction of the globe, and those involving neighbouring cavities, such as the frontal sinus, cranial cavity, etc.

The final three chapters deal with treatment, the last being devoted to plastic surgery. The author gives some useful hints on this difficult subject, and is particularly laudatory of cartilaginous grafts.

J. HERBERT PARSONS.

NOTES

Deaths

THE death is announced of Edgar Athelstane Browne, at Kirby View, Caldy Road, on June 27, at the age of 75 years. Late lecturer on ophthalmology in the University of Liverpool, he was at the time of his death consulting surgeon to the Liverpool Eye and Ear Infirmary. The funeral service took place on June 30 at St. Margaret's, Prince's Road. We hope to publish an appreciation of Mr. Browne's life and work in our next issue.

Captain F. H. Knaggs, R.A.M.C., whose death is announced, was in practice at Huddersfield. On joining the R.A.M.C. he became ophthalmic and aural surgeon at the Huddersfield Infirmary and War Hospital.

The death of the following American ophthalmic surgeons is announced:—Nolen, Charles F., Baltimore, 47 years; Wolff, Benjamin, New York, 42 years; Corrigan, John J., Pawtucket, 59 years; Horlbeck, Henry, Columbia, 43 years; Dunn, M. C., 52 years; Clark, George F., Winchester, 47 years; Baker, H. D., Springfield; Walling, W., Chicago, 68 years; Gailey, E. S., Jacksonville, 43 years Hogsett, C. G., Fort Worth, 44 years; Winslow, W. H., Boston, 76 years; Caffey, H. B., Pittsburg, 37 years.

* * * *

Honours

THE D.S.O. has been conferred upon Lieut.-Col. R. E. Bickerton.

The C.V.O. has been conferred upon Captain R. R. Cruise, R.A.M.C. (T.)

The name of Col. W. T. Lister, C.M.G., was included in the list submitted by Sir Douglas Haig in his dispatch of April 9 as deserving of special mention.

* * * *

Appointments

MR. THOMAS H. BICKERTON, consulting ophthalmic surgeon to the Royal Infirmary, has been appointed by the University of Liverpool to the lectureship on ophthalmology, in the place of the late Mr. Edgar A. Browne. Mr. Bickerton has been asked by

the Committee of the Royal Infirmary to continue his duties as ophthalmic surgeon until the termination of the war.

Dr. A. J. Ballantyne, who has recently received a temporary commission in the R.A.M.C., has been appointed ophthalmic surgeon to the 67th General Hospital, which is expected to proceed shortly to Salonica.

Mr. J. R. Foster, ophthalmic surgeon to the Hartlepool Hospital, has been appointed temporary surgeon to the Durham County and Sunderland Eye Infirmary, the staff of which is stated to be much depleted owing to the war.

Mr. A. A. Bradburne has been appointed ophthalmic surgeon to the Victoria Memorial Hospital, Manchester.

* * * *

Protection of the eye in warfare

IN reference to the communication by Captain R. R. Cruise, published in abstract in another part of this issue, the Ophthalmological Society passed the following resolution :—

"The Ophthalmological Society of the United Kingdom, having examined the steel visor designed by Captain Cruise, has every reason for believing that it would prevent at least 50 per cent. of the eye injuries received in warfare. The visor has received the strong approval of ophthalmic surgeons in the field and at home. This society begs respectfully to urge that its production should be expedited, and that its application and method of use should be placed under the supervision and control of a competent authority."

* * * *

Fellowships in Ophthalmology

FELLOWSHIPS in ophthalmology and oto-laryngology, in connection with the University of Minnesota, have been established by Drs. F. C. Todd and F. E. Burch, both connected with the teaching staff of the School of Medicine. These appointments carry with them a stipend of $500.00 for the first year, $750.00 for the second year, and $1,000.00 for the third year. The fellows will devote one-half their time to work in the private clinic of Dr. Todd or Dr. Burch, and the other half to laboratory and clinical work and in the pursuit of certain courses for specialists in ophthalmology and oto-laryngology in the University of Minnesota. Applications for these appointments may be made to Dr. F. C. Todd, Minneapolis, Minn., U.S.A.

* * * *

Blind Babies

FROM a letter by Adeline Duchess of Bedford and Sir Arthur Pearson, published in the *Daily Mail* of June 26, we are glad to learn that a new project has been initiated for the benefit of blinded infants. These children are below the age (five years) when the public authority takes charge of their education in schools, residential and

otherwise. Yet it is of vital importance that the education of the blind baby should begin from earliest infancy. These young children are too often neglected. The position, indeed, is a difficult one for parents, even when possessed of moderate means, more especially if they live remote from large centres. In the case of poor households, no special method is usually adopted, and (to quote the letter) "these infants are brought up more like little animals than human beings." They form bad habits which often prove incurable when school age is reached. The National Institute for the Blind has purchased a house at Chorley Wood, where twenty-five blind babies will be cared for until they reach school age. The writers of the letter express the hope that this example will be followed by the institution of other homes for blinded infants in various parts of the country. We sincerely trust that their wish will be realized.

* * * *

Artificial Eyes

UNDER the Defence of the Realm Regulations, those engaged in the manufacture of artificial eyes are required to send in to the Director of Optical Munitions and Glassware, 117, Piccadilly, W., returns of the number, type and material of all artificial eyes in their possession or under their control.

* * * *

Middlemore Prize, 1917

ON the recommendation of the Science Committee and the adjudicators, the Council of the British Medical Association has awarded the Middlemore Prize for 1917 to William Clark Souter for his essay on "Disorders of the eye and of its functions induced by war injuries not directly affecting the eye."

* * * *

Ætiology of iridocyclitis

MR. S. JOHNSON TAYLOR draws attention (*Lancet*, June 30, 1917) to the importance of constipation in the causation of serous iridocyclitis, and to that condition assigns the greater prevalence of the disease in women.

FUTURE ARRANGEMENTS

	1917.	
Colorado Ophthalmological Congress	August 9 and 10	Denver, Colorado.
American Academy of Ophthalmology and Oto-Laryngology	October 29, 30, and 31	Pittsburg, Pennsylvania.